A GENERIC MODEL FOR EFFECTIVE IMPLEMENTATION OF EMPOWERMENT IN CONSTRUCTION CONTRACTOR ORGANISATIONS

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A GENERIC MODEL FOR EFFECTIVE IMPLEMENTATION OF EMPOWERMENT IN CONSTRUCTION CONTRACTOR ORGANISATIONS

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My Parents

ABSTRACT

This study addresses reengineering of UK construction (contracting) organisations for continuous business improvement, by the use of the concept of empowerment. The main aim of this research is to develop an implementation model, along with a best practice framework, to assist construction organisations in effectively implementing empowerment. This also includes identification of 'efficacy' information and their flow between various business participants (employees).

Initial investigations, including literature search and questionnaire survey within leading UK construction and manufacturing companies identified and subsequently confirmed sixty two key empowerment *activities* attributed to nine major *elements*. The nine major elements are: leadership; empowerment system; resources development; involvement; education and training; teamwork; process improvement; performance measurement; and recognition. This indicates that the modern empowerment concept is no longer a domain of simply Participation in Decision Making (PDM) and 'delegation of authority'. In addition, it includes several areas of the business as above. Analysis of the survey also developed an activity model along with an Empowerment Implementation Profile, using which companies can benchmark their implementation efforts.

Having confirmed the basic constructs (elements and activities) of empowerment implementation, three of the major UK construction companies, who had pioneered with empowerment were studied in detail as to how to effectively implement empowerment in construction organisations. Using Structured Data Analysis (SDA) techniques, the current systems of these three organisations were studied separately and subsequently, a generic model (along with a best practice framework) was developed. The SDA techniques also helped to identify and map the flow of efficacy information which is critical in the implementation of empowerment. Case studies also revealed that there has been a correlation between empowerment implementation and Strategic and Operational business performance improvement. Finally, a detailed feasibility study conducted amongst some of the leading construction companies confirmed that the model is technically, economically, and socially feasible to be applied to different types of construction companies.

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TABLE OF ACRONYMS USED IN THIS THESIS

Agi	Agreement indices
ANOVA	Analysis Of Variance
BS	British Standards
BT	Benchmarking Team
CASE	Computer Aided Software Engineering
CRSA	Control and Risk Self-Assessment
DFD	Data Flow Diagram
DT	Dream Team
EAM	Empowerment Activity Model
EIP	Empowerment Implementation Profile
EQA	European Quality Award
GDFD	Generic Data Flow Diagram
GM	General Motors
GSC	Group Steering Committee
HIPO	Hierarchical Input Process Output
IR157	Inland Revenue 157
ISO	International Standards Organisation
MAgi	Mean Agreement indices
MD	Managing Director
NPS	New Production System
OBP	Operational Business Performance
PDM	Participation in Decision Making
QA	Quality Assurance
QAT	Quality Action Team
QFD	Quality Function Deployment
QIT	Quality Improvement Teams
QMT	Quality Management Team
RMT	Regional Management Team
SADT	Structured Analysis and Design Technique
SBP	Strategic Business Performance
SDA	Structured Data Analysis
SDWT	Self Directed Work Teams
SPC	Statistical Process Control
SSADM	Structured Systems Analysis and Design Methodology

TQM	Total Quality Management
UK	United Kingdom
USA	United States of America

Chapter One

Introduction

1.1 Background to the research

The UK construction industry represents over 200,000 enterprises and 8 per cent of GNP (Latham, 1994). It is generally recognised that UK construction firms are looking more and more to overseas markets to support ailing workloads. Contractors and construction professionals alike face competition from such countries as Germany, Finland and Italy (Hillebrandt and Cannon, 1990; CIRIA, 1990). Hence, as international competition intensifies, leading construction organisations throughout the world are striving to be more effective and to enhance their competitive position by improving their performance.

There is currently a high level of dissatisfaction amongst UK clients of the construction industry regarding delivery of completed projects, the quality of service, and predictability of cost. In an attempt to address these problems and improve construction processes, the key drivers to change in the construction sector [such as the Technology Foresight (1995) and Latham (1994)] have emphasised focus on teamwork, empowerment, and partnering. In particular, the Technology Foresight expressed its dissatisfaction over the construction industry regarding lack of innovation and developments, that are widespread in other industries. It advised that the construction industry reengineer basic processes to provide 'lean' rapid and effective performance. Such performance is commonplace throughout other industries (e.g. manufacturing and service). Also it is a fact that the construction industry (post industrial revolution) has followed manufacturing, in adopting innovative concepts and best practices to achieve improved processes and reduced costs. The need

for design and construction organisations to rethink and redesign their processes is primarily driven by the following pressures:

- globalisation of the economy;
- greater performance expectations from clients;
- greater competition amongst domestic organisations;
- continued restructuring of work practice;
- improvement of industrial relations; and
- enterprise bargaining (Technology Foresight, 1995; Lover and Mohammed, 1995).

These pressures are influenced by three major factors (i.e. environmental, technological, and psycho-social), which can cause unprecedented problems such as sudden market recession, increased competition, and so on (Kast and Rosenzweig, 1985; Newcombe et al, 1990). To efficiently address these pressures (and hence changing trends), continuous improvements in both 'people' and 'processes' are advocated. Both people and process elements are interrelated; poor performance of the one impedes improvement of the other (Koskala, 1992; Womack et al, 1990; Jawahar-Nesan and Price, 1997). These two elements link to productivity in such a way that the improvement of productivity lies in the structure of the process itself (Deming, 1982; Hammer and Champy, 1993). On the other hand, improvement of processes lies in the hands of employees (people) who actually perform them; this seeks employees to be empowered in improving their processes themselves (Ripley and Ripley, 1992; Pheng and May, 1997; Hammuda and Dulaimi, 1996).

In addition, modern management concepts (such as TQM, Reengineering, and Concurrent Engineering) also advocate employee empowerment for both incremental and radical improvements (Koskala, 1992; Womack et al, 1990). These concepts need to be well

orchestrated to analyse existing processes or methods and establish new ones with the participation of employees: the introduction of new processes alone (i.e. without employee involvement) being insufficient to guarantee improvement in performance. There also needs to be effective leadership, increased empowerment and more integrated approaches to training, that take account of the newly developed processes. This requires management to consider the culture of an organisation, in particular, individuals at the work face, to implement meaningful change (Jawahar-Nesan and Price, 1996; Pheng and May, 1997).

In essence, all of the foregoing problems (solutions) seek employee empowerment (along with appropriate leadership styles and sufficient employee training), for construction organisations to effectively cope with constant changes in the environment (i.e. environmental, technological, and psycho-social) within which they operate. According to Hillebrandt and Cannon (1990), UK construction organisations have accepted that changes might be necessary in the future. However, they identified that managers of construction firms are lacking on knowledge of relevant concepts. Further, that organisations are lacking on relevance organisational theory, structure and behaviour in the implementation of change. In particular, investigation by Hammuda and Dulaimi (1996) concluded that construction is very much behind in effectively applying empowerment in comparison with the service and manufacturing sectors.

Having realised the above problems, recent attempts have been made to investigate empowerment in construction organisations (Hammuda and Dulaimi 1996; Pheng and May, 1997). However, these studies did not resolve the conceptual confusion on empowerment, that has existed over more than three decades in the literature, nor has an effective strategy to implement the concept in construction organisations been established.

This calls for an investigation to develop an effective implementation strategy to assist construction organisations in the implementation of empowerment

It should be noted that the term 'construction organisations' used throughout this thesis refers predominently to construction contractor organisations.

1.2 Aims and objectives of the research

In recognition of the above background, this research set out to produce an appropriate strategy (along with an application model) to assist construction organisations in effectively implementing empowerment. Since empowerment is primarily meant for process (and performance) improvement, it requires employees to be sufficiently skilled on relevant tools and techniques to effectively perform their processes. This also includes appropriate leadership styles of management to motivate and assist employees in improving business processes. Therefore, in essence, the research identified the following objectives:

- To evaluate the current status of empowerment implementation within the manufacturing and construction sectors.
- To ascertain and assess the characteristics of new leadership styles that encourage employees to manage their own work.
- To identify the information that enhances feelings of self-efficacy among employees.
- To develop an implementation model so as to assist effective implementation of the empowerment concept within construction organisations.
- To develop a best practice framework for the training and management of the social system of construction (contractor) organisations, taking into account the management of change and empowerment.

- To assess the influence of empowerment on contractors' performance.

1.3 Research methodology employed

To achieve the stated objectives, this research consisted the following four phases:

1. Theory development (detailed literature review)
2. Questionnaire survey
3. Case studies of selected companies who have implemented empowerment
4. Feasibility study (validation).

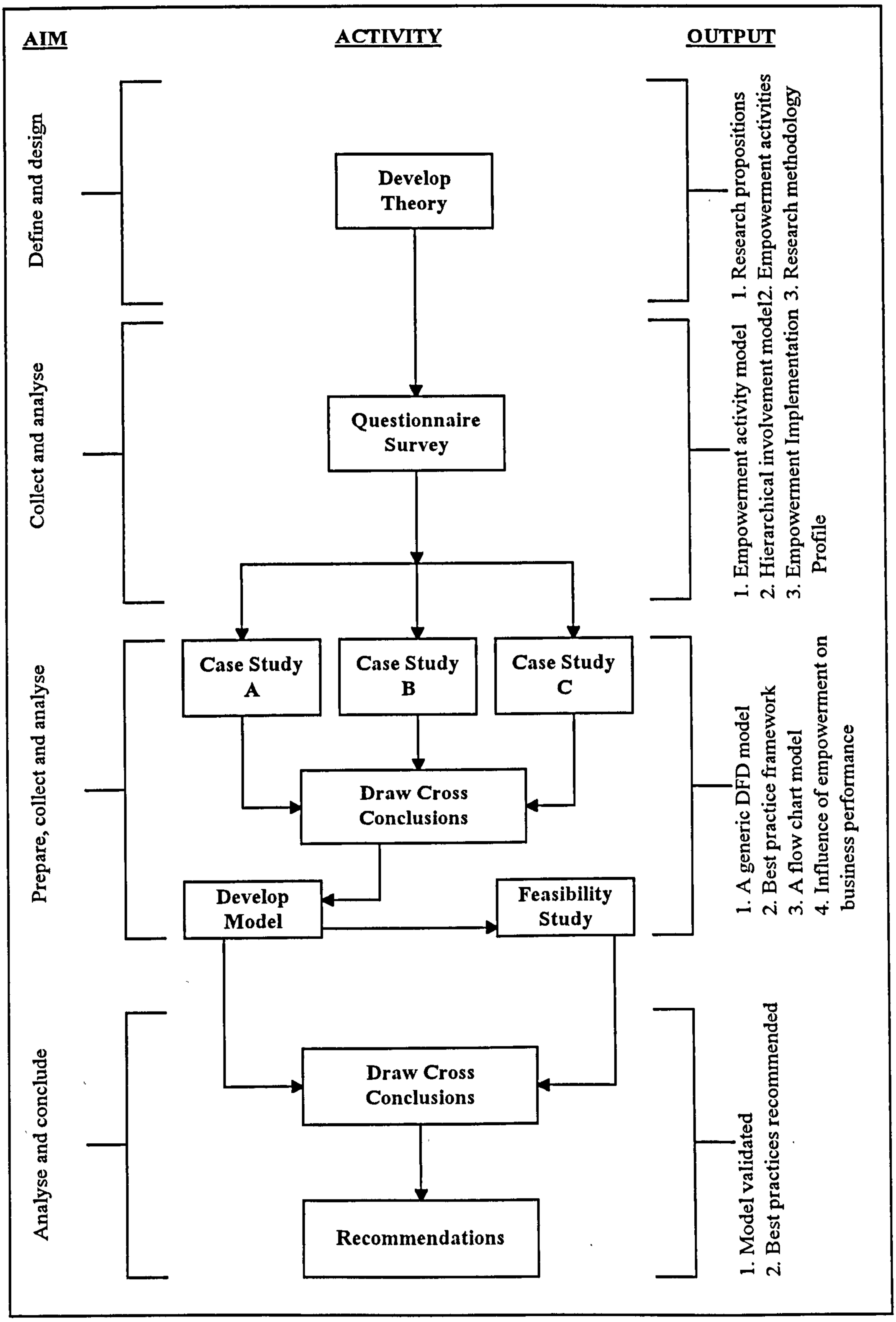
Figure 1.1 illustrates this four stage methodology, along with the principal sub-activities that were undertaken in this research. The four stages are now briefly explained.

1.3.1 Theory development

The objective here was to develop the theory (including clarification of conceptual and methodological confusion of the empowerment concept) with the initial propositions relating to the research inquiry. Review of both construction and manufacturing literature (including case study literature of successful empowerment implementing manufacturing companies) identified nine major elements of empowerment, consisting a total of sixty-two activities (attributed to these respective elements). Based on the nine elements, nine initial propositions were set out as follows:

- **Proposition 1 (Leadership): Managers and supervisors act as leaders. Leadership exists at all levels of the organisation, including within every empowered employee.**

Figure 1.1. Research method



- **Proposition 2 (Empowerment system): A system, inherently possessing appropriate policy, procedures and plans, facilitates effective implementation of empowerment throughout the organisation.**
- **Proposition 3 (Resources development): Resources (such as fund, equipment, working conditions etc.) are provided to or are accessible by, employees to support the empowerment process.**
- **Proposition 4 (Involvement): All individuals (and teams) are involved in the process of empowerment with common objectives.**
- **Proposition 5 (Education and training): Employees at all levels of the organisation are continuously trained in terms of technical, group dynamics, problem solving, and decision making skills to manage their own processes.**
- **Proposition 6 (Process improvement): Employees control their own processes, and focus on continuously improving them.**
- **Proposition 7 (Teamwork): Teams of different kinds (e.g. delegated teams, cross-functional teams, self-managed teams) are established at various levels of an empowered organisation.**
- **Proposition 8 (Measurement): Everyone involved in empowerment measures and records the effects of empowerment, including successes and failures, to monitor progress and strive for further improvement.**
- **Proposition 9 (Recognition): Recognition of achievements (individuals, teams and departments) motivates them to perform at highest standards.**

1.3.2 Questionnaire survey

The theory developed in the literature phase was confirmed, and its feasibility to the construction sector was achieved, through a structured postal questionnaire survey conducted amongst both manufacturing and construction organisations. The manufacturing sample was included because the identification and development of activities was primarily based upon that sector. The results of survey analysis revealed a

demonstrable coincidence between the findings of the literature review and their potential application to construction organisations.

The key outcomes at this phase included: a conceptual empowerment activity model applicable to the construction sector; understanding of the degree of organisational (hierarchical) involvement in implementing empowerment; an Empowerment Implementation Profile for measuring the extent of empowerment implementation in construction organisations; and identification of construction companies practising empowerment for further case study.

1.3.3 Case studies

Having confirmed the criticality of empowerment activities, they were further investigated in detail as to understand: how they can be efficiently used in construction organisations; performed by whom and to what extent; and what (efficacy) information is required to effectively implement them. These aspects were investigated amongst three major construction companies who had pioneered the implementation of empowerment. The three companies were large companies having several operating units both in the UK and abroad. Employee size of these companies was approximately 2000.

Data obtained from the case studies were analysed using several techniques, predominantly, systems analysis incorporating Data Flow Diagram (DFD) techniques, which resulted in a generic DFD model for effectively implementing empowerment in construction organisations, along with a best practice framework. To support this model, system flow chart models were also developed to show the involvement of participants. The study also assessed performance of (case study) organisations in light of empowerment implementation.

1.3.4 Feasibility study

Finally, the model was validated by conducting a feasibility study. To conduct this study, a draft proposal (document) describing the generic model along with assessment criteria (i.e. economical, technical and social) was submitted to (construction) organisations who had shown interest in participating in future aspects of this research. Their assessments were collectively analysed to validate the feasibility of the model. In addition, validation of the developed model was an on-going process throughout the course of this research, which included triangulation and/or corroboration strategies (i.e. investigating convergence amongst different sources of information).

1.4. Research achievements

The research set out to investigate and develop an efficient system to assist construction organisations in re-engineering their current systems for implementing empowerment. As a result, the main achievements of the research are summarised as follows:

- A critique of current performance of UK construction organisations, and highlights of latest improvements that the construction sector could import from manufacturing were established.
- The development of an activity model (incorporating sixty-one empowerment activities) to assist construction companies who are forming an empowerment implementation strategy.
- Assessment of recent trends in the implementation of empowerment in both construction and manufacturing sectors.

- The development of a 'Relative Hierarchical Involvement Chart' that depicts significant involvement of, and input by, the four levels of an organisation (i.e. strategic, general, operational, and direct work) in performing the empowerment activities.
- The development of an EIP (Empowerment Implementation Profile) model that will assist construction organisations to *benchmark* their level of progress in the implementation process.
- The development of a generic DFD model along with a best practice framework for effective implementation of empowerment in construction organisations.
- The research has achieved collaboration with several major UK construction companies, who provided all necessary information throughout this research. Companies who participated in the feasibility study have reviewed and compared their own current systems based on the feedback from the research. Such exercises were reported as offered good insights to them in the implementation of empowerment.
- Part of the major findings of this research has been disseminated through several means, including international Conferences, Workshops and Journals.

It should be borne in mind that the DFD model has several limitations. They are: it was developed from the background of large construction companies having several operating units; it considered only the permanent staff within construction (contractor) companies (direct site labour was not included); and company's project level dealings with other project participants such as clients, sub-contactors, and suppliers were not included. The model is designed to be deployed within an individual construction (contractor) organisation.

1.5 Organisation of the thesis

Chapter Two: Conventional management of construction organisations and related problems

This chapter comprises two main sections. The first section critically reviews the conventional management system of construction organisations and its inability to effectively respond to changing demands of the construction environment. The second section highlights latest improvements that the construction sector could import from manufacturing in the effective management of construction organisations' social systems.

Chapter Three: An alternative to the conventional approach: the modern empowerment concept

This chapter reviews the basic constructs of empowerment and related models proposed by theorists, and finally identifies the fundamental components (elements) that have to be addressed for successful implementation of empowerment. This generates nine *propositions* for subsequent investigation in this research.

Chapter Four: Research design

This chapter highlights the inquiry of and related data required for this study and briefly discusses the research strategy that was developed as being appropriate for this research.

Chapter Five: Current practices of empowerment and empowerment activities identified

This chapter further explores the nine propositions in two dimensions viz.: theoretical implications on their implementation; and their current practise in the industry (both construction and manufacturing). Consequently, the chapter identifies sixty-two empowerment activities that result in improved performance in effectively implementing empowerment.

Chapter Six: Evaluation of empowerment activities and their current usage

Having identified key empowerment activities from the literature review (Chapter Five), this chapter goes on evaluate them in terms of applicability to the construction sector. This was achieved using data obtained from a structured, postal questionnaire survey. The main objectives of this survey were to: assess perceptions of both construction and manufacturing sectors on the said empowerment activities; identify the extent of use of each activity in both manufacturing and construction sectors; and assess the degree of organisational involvement in performing those activities.

Chapter Seven: Modelling the implementation process of empowerment

This chapter discusses relevant systems modelling tools and techniques, and concludes by identifying the most appropriate techniques for this research.

Chapter Eight: A generic model and best practice framework for implementing empowerment in construction organisations

This chapter, initially, discusses three case studies each separately, and finally produces a generic model (along with a best practice framework) for effectively implementing empowerment in construction organisations. The model was developed using Data Flow Diagrams (DFD), with one of the CASE (Computer Aided Software Engineering) tools named SSADM (Structured Systems Analysis and Design Methodology). Cross analysis of the three case studies also includes examination of the model by finding replications of events occurring in three different settings (case studies A, B, and C).

Chapter Nine: Validation and Evaluation of the generic model

This chapter evaluates the model in two perspectives: 1) internal validation - finding triangulation of and convergence among three main sources of information, i.e., literature search, questionnaire survey, and case studies; and 2) external validation. For the external validation, the chapter discusses the feasibility of the model using data obtained from expert opinion.

Chapter Ten: Conclusions and recommendations

This chapter presents the main conclusions of the research and highlights identified problems that are ripe for further investigation.

Chapter Two

Conventional Management of Construction Organisations and Related Problems

2.1 Introduction

This chapter comprises two main sections. The first is a critical review of construction organisation characteristics (including environmental, socio-technical, cultural, and organisational) and the often inability of their conventional management systems in effectively responding to changing demands of the construction environment. This review includes a critique of current performance of UK construction organisations, within the context of the most favarouble determinants for an effective system of a construction organisation. The second section of the chapter contrasts, chronologically, the three most popular theories (craftwork paradigm, mass production philosophy, and new production philosophy) through which both construction and manufacturing sectors have learnt from each other in improving their business processes. This section also highlights the latest improvements that the construction sector could import from manufacturing, in the effective management of construction organisation's social system.

2.2 Construction organisations and operating functions

In the context of this research, the definition of a construction organisation is predominantly that of a construction contractor, being principally involved in the production of constructed facilities, including civil engineering, building, offshore engineering, and nuclear plants. There is vast diversity among construction organisations in terms of volume of work undertaken, technology employed, product supplied,

geographical dispersion and so on. Broadly, such organisations operate either as main contractors (i.e. managing and directing all works on site) or, as nominated or 'ordinary' subcontractors. This research centres predominantly around main contractors, of which there are four main types: general contractors; specialised main contractors; small works contractors; and embryonic 'project management' contractors (Lansley 1994). As each of these has quite different tasks and functions, hence, they cannot easily be described through a single organisational structure uniquely. However, Forster (1994) observed two different patterns of organisational structure amongst UK construction organisations: small to medium-sized companies and medium to large-sized companies (see Figures 2.1 and 2.2).

These structures are not prescriptive, there are other varieties of structures but all are centred around these two generic structures. That is, the two are flexible. The role of departments is partially shown on the diagram. However, most organisation's activities can be broadly in line with the functions specified by Grummitt (1968), these being:

- getting the work - this includes estimating and marketing/public relations/sponsorship type activities
- doing the work - including site management, purchasing materials, plant management, safety, planning, work study; and
- getting paid for the work - the role of the quantity surveyor and accountant are crucial in ensuring good cash management.

Harris and McCaffer (1993) illustrated, in detail, the above tasks under five major functions: *Production* - project construction; *Selling* - estimating, tendering and negotiation; *Services* - central planning, temporary works design, cost and budgetary control, payment and claims, work study, plant; *Financial control* - capital procurement,

cash flow, bookkeeping, accounts, statutory returns; *Administration* - health and welfare, wages and salaries, training and education, public relations, records, maintenance and

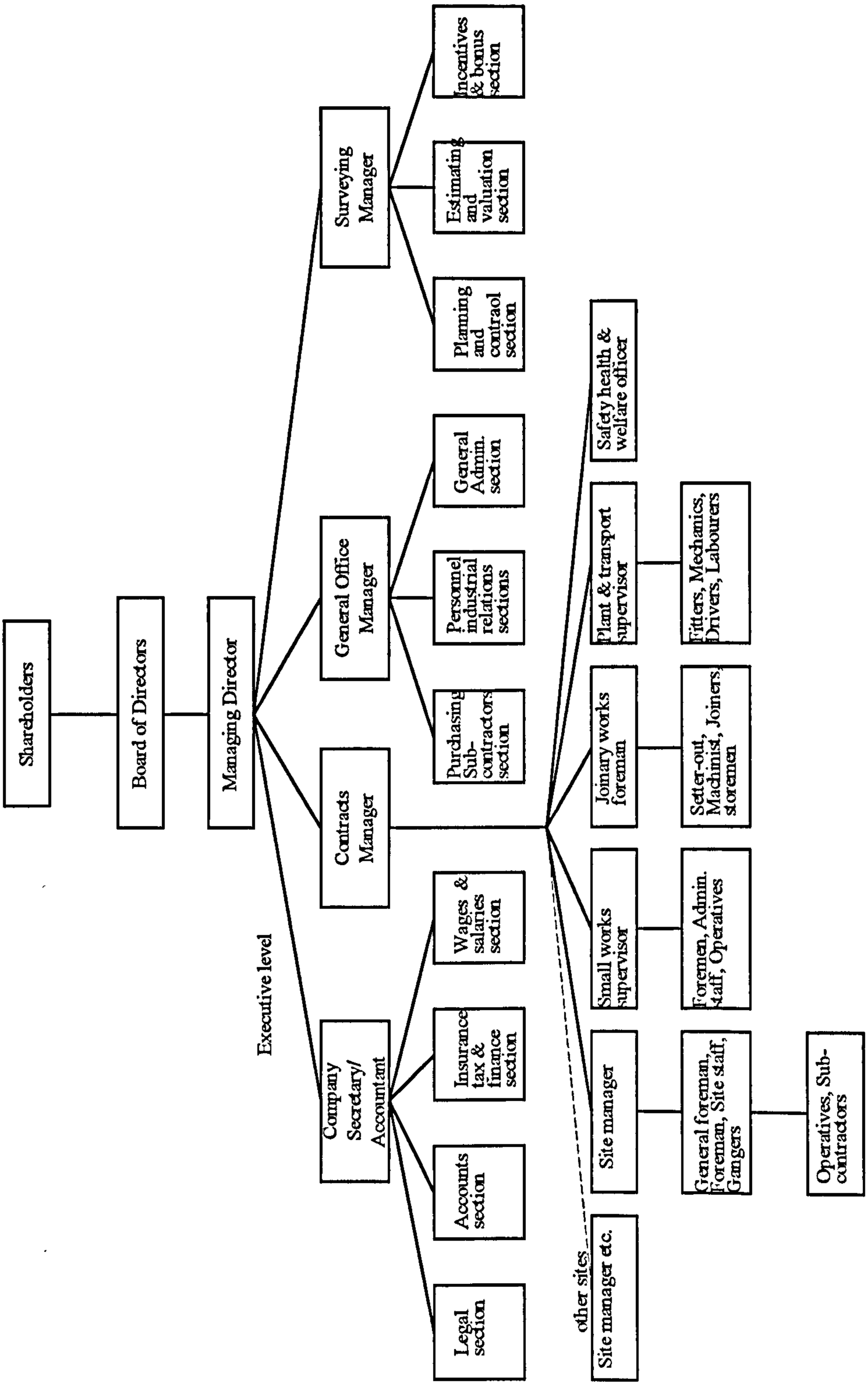
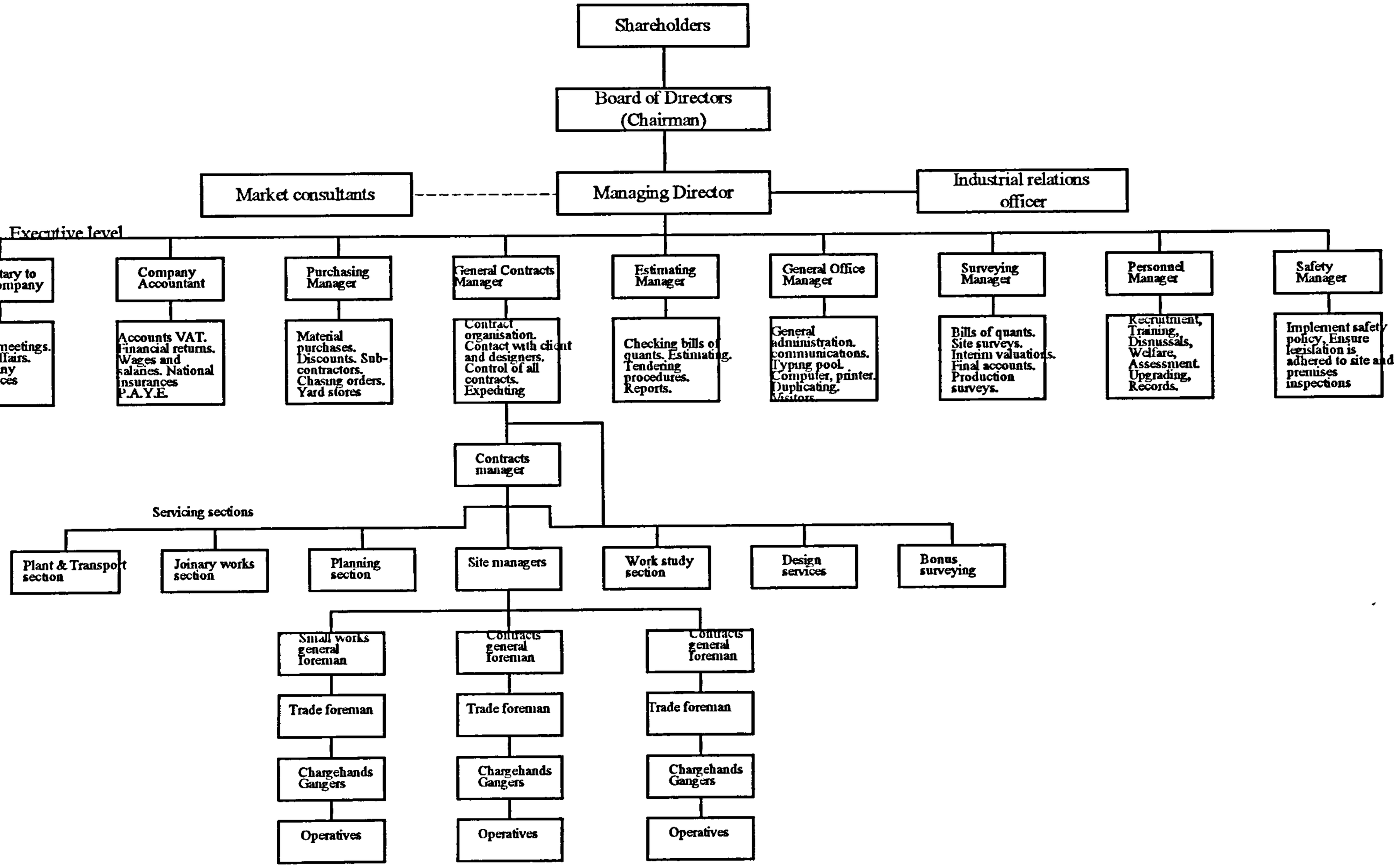


Figure 2.1: Organisational structure of small to medium-sized organisations

(Adopted from Forster, 1994)

Figure 2.2: Organisational structure of medium to large-sized organisations



(Adopted from Forster, 1994)

legal matters. Newcombe et al (1990) enumerated these tasks in terms of *levels* of the organisation, *functions*, and geographical *location*. Such an approach provides a clearer picture of the organisational involvement in performing these tasks. In general, they distinguished three levels in a construction organisation: the corporate level, the business level; and the operational or project level. Pilcher (1992) and Hillebrandt and Cannon (1990) also agreed that there are three levels in a construction organisation. These are the strategic level (participants include the chief executive and executive directors), organisational or co-ordinative levels referring to the business level (participants include buying, estimating and planning departments) and the technical or operational levels (participants include the site manager, project manager and operatives if any).

Corporate level tasks are concerned with the direction of the whole organisation and are mainly strategic in nature. Typically, these tasks include: the decision to expand (or contract) any particular department or service; to create a separate profit centred division to manufacture building products; to examine the company's mission; analysis of the company's resources and so on.

Business level tasks are concerned with implementing the strategies detailed at corporate level. In construction organisations these tasks tend to be located at central or regional offices of the firm. Typical activities are directing divisional and/or departmental activities which are concerned with a single market or discipline.

Operational or project level tasks are specifically focused on short term, temporary objectives. For example, the site manager will be co-ordinating the activities of a diverse group of directly employed or sub-contract labour in striving for completion of a current project. Because of social and economic fluctuations and, the complexity of construction projects, most UK construction organisations do not employ direct labour (operatives).

Alternatively, they either appoint labour only subcontractors or sublet the work to sub-contractors (Hillebrandt and Cannon, 1990; Forster, 1994).

In contrast to the above, some suggested that construction organisations comprise four levels (Simister, 1994; Clark, 1989). According to Simister, they are: strategic; general; operational; and direct work. Clark describes four levels as: top layer; technostructure; site and project management; and direct operating units. The strategic level is represented by the company's main board and other relevant senior staff. The general level includes marketing (including estimating and tendering) and personnel. The operational level represents operational units of the company (including project management). The direct work level represents site management and operatives.

Depending on the size of the organisation and type of work carried out, functions of construction organisations vary. In general, most of the expanding or larger construction organisations have in-house specialist functions such as as estimating and marketing, construction materials and plant, surveying and accounting, legal, secretarial, and safety. Another important factor by which construction organisations' tasks may vary, is that of degree of site office autonomy. That is, some of the key business tasks are devolved to building sites. In such cases, at centre the organisation is primarily concerned with obtaining and developing resources to maintain the business. At site level the objective is to use these resources to meet the client's objectives.

2.3 Construction organisations' structure and management problems

The above section briefly described typical structures of UK construction organisations, and gave an overview of the general tasks being undertaken at various organisational levels. This section analyses construction organisations' structures in the light of

organisational theories and highlights consequent problems that hinder their effective management.

Burns and Stalker (1966) asserted the need to adopt a structure built according to a particular type of technology employed by the organisation, and the kind of environment encountered by it. They identified two types of organisation: mechanistic and organic. Mechanistic organisations are considered to have strong vertical specialisation and control. They have well documented policies and procedures for both decision making and control. The hierarchy of control is centralised with a well defined division of labour. Organic organisations are typified by a decentralised hierarchy of authority with horizontal specialisation, few policies or procedures, and with informal co-ordination and control. The choice of organic or mechanistic types are a function of several determinants. For instance, the environment, past and present, has been shown to be a major factor in shaping the internal structure of organisations (Newcombe et al, 1990). However, there are three main determinants that guide in the design of organisational structures: environmental interactions; the technology used by the organisation; and psycho social influences (Kast and Rosenzweig, 1985). It has been suggested that construction organisations should be of a more organic nature, in order to cope with the turbulent behaviour of the above three influences. Each of these influences is now investigated in turn:

2.3.1 Environment

Environmental interactions are concerned with the ways in which an organisation will deal with the environment through input and output. Shirazi et al (1996) identified the environments that organisations face under three dimensions: ranging from *stable* to

dynamic; from *simple* to *complex*; and from *friendly* to *hostile*. All these three dimensions are interlinked with each other in a sense that characteristics of one can affect others.

Factors stated to influence the *stability* of the environment include shifts in the economy, variations and changes in clients' requirements, changes in project goals, and labour availability (Hillebrandt et al, 1995; Shirazi et al, 1996). For example, alternate boom and recession of the UK economy from 1980 and 1993 have made construction firms realise the inability of their organisational systems to be quickly adaptable to a changing environment. During the boom, UK firms have neglected overseas markets, and tended to ignore internal structures. However, since the recession, according to Hillebrandt et al, many UK firms had to rethink the way in which they were managing their business because of the following reasons:

- dramatic falls in construction investment since the recession in the UK economy;
- privatisation of the water, sewerage and energy industries, which changed the role of the public sector as the major client of the industry;
- directives from the European Union which have affected spending on utilities and infrastructure in the UK; and
- changes in the environment pattern, like more women at work, more part time work.

The above changes have created a situation where large firms are competing with many more firms (including small firms for small works) than previously. Tender prices have fallen dramatically, and many contractors have been bidding at low cost. In attempts to redress the situation some firms had made strong efforts to obtain more work abroad. However, there have been problems in the international scene: the world market was shrinking; local contractors were competent; and newly industrialised countries are increasingly involved in exporting contracting services. These changing environment (since recession), induced construction organisations to investigate their internal structures

and systems and attempt to identify problems inherent within them (Hillebrandt et al, 1995). Such problems have been identified as:

- Existence of everal separate construction divisions without a common policy
- The failure to make best use of cash generated
- Overmanning at the top' with duplication of management functions
- Overlarge boards fragmented into a number of separate interest groups
- Board meetings at which inadequate control over the various businesses was exercised and little tangible action agreed
- Too many minor business activities
- Failure to appreciate the management problems of business recently acquired and to deal with them
- Inadequate control over capital expenditure on land acquisition
- Excessive emphasis on profit and loss accounts at the expense of adequate monitoring of adverse balance sheet developments including failure to maintain a register of group properties
- Neglect on international markets because of the UK boom.

Stemming from this, firms have had to rethink their structure. This is because of earlier failures, in some cases by top management, to control the activities of all parts of their business, and by the need to reduce overheads to survive. Several senior managers considered that over a long period of time the lack of controls and sloppy management structures were partly responsible for their difficulties during the recession (ibid). The most obvious failing, as quoted by Hillebrandt et al, was in providing high flyers with a good insight into areas of business strategy at an early enough stage in their careers, and in ensuring that they had received a good grounding in inter-personal skills, team building and decision making. In essence, firms suffered serious setbacks during changing economic situations because of some main reasons, being: lack of an effective social

system that continuously update employees' skill and attitude towards a changing environment; presence of a highly bureaucratic structure; and lack of common objectives and lack of efficient control mechanisms. Thus, the construction environment is *dynamic* in nature, hence the organisational structure cannot be rigid and cannot rely on standardisation or formalisation as a co-ordinating mechanism. Alternatively, it must seek mutual adjustment and encourage informal communication.

The second dimension ranges between *simple* and *complex* depending on the complexity of the work to be done. In construction, complexity is largely affected by the type and size of the project, type of activities undertaken by the organisation, the scale of involvement of the client, and the input required in programming and controlling the work. These indicate that construction is always a complex process requiring a multitude of participants with common objectives, technology suitable for each project, thousands of different materials, and a host of procedures. When the organisation is faced with a complex environment, Shirazi et al (1996) suggested that: authority to take decisions is delegated to middle line managers, staff specialists and trained professionals at the operating core; and that (work) units or subunits possess the ability to take decisions for themselves on issues which are reserved for a higher level in a comparable organisation. This approach emphasises the need for continuous skill development of staff and departments and the need for them to be empowered to take decisions on complex problems. However, in reality, practice amongst construction firms is different. Investigation by Hillebrandt and Cannon (1990) confirmed that control by head office over operating units has increased, and that there have certainly been more formal procedures. Hillebrandt et al (1995) indicated that less training was one of the cost cutting strategies amongst construction firms studied by them.

The third dimension, ranging from friendly to hostile, affects construction organisations in a way that hostility demands fast reactions by the organisation. Hostility is influenced by competition, by adverse relations between involved parties (including industrial relations), by project location and by extreme weather conditions (Shirazi et al, 1996). Case studies conducted by Shirazi et al revealed that hostility resulted in temporary centralisation of structure and greater reliance on direct supervision in order to achieve greater control over the (hostile) problems. In essence, construction organisations should be able to cope with all three dimensions of environmental effects (i.e. dynamic, complex, and hostile). To achieve this, organisations need to be more flexibly structured and employees should be more capable (skillful) and empowered (within the control mechanism) in dealing with their environment.

2.3.2 Technology

Technology utilisation also has an influence on organisational structure. The technology of the production process employed by the organisation will have the greatest effect on the structure of that part of the organisation that is directly responsible for transforming the input of all types of resources and outputting the finished product (Pilcher, 1992). Clients indirectly demand adoption of updated technology to increase the efficiency of construction. Technology affects productivity; often major increases in productivity are associated with technological advances, notably increased efficient use of plant. However, it is a popular belief that technologies which are used in the USA are adopted about ten years later in the UK (Newcombe et al, 1990). Work by Kabasakal et al (1989) revealed that technology is strongly associated with decentralisation of authority. This indicates that sophistication in construction technology seems to lead to a decentralised structure. As suggested by Kabasakal, this may be due to more professionalism of site management.

2.3.3 Psycho-social influences

Traditionally, many numerate and normative models have been developed to aid decision making by managers, with the ambition of achieving an organisation's goals with maximum efficiency. Those models have dealt more with managing the technical aspects of construction business. However, there appears less focus on the study of human factors in organisations and of the manner in which people behave within them (Druker et al, 1996; Lansley, 1994). In the dynamic, complex and uncertain environment characterised by construction, employees have to be able to respond to varying degrees of control or to different patterns of authority and responsibility. In efficiently responding this environment, a major factor in this determinant (social influence) is likely to be the educational levels of the individuals concerned. This combined with the generally accepted standards of autonomy that are associated with the relevant position in their experience (Pilcher, 1992). In order for employees to act autonomously, sufficient training or education should be continuously delivered to them. Storey (1992) identified the emphasis for a positive approach to managing the climate and culture of the company, specifically the "learning company" approach to employee development. The underlying principle in this 'soft' approach is that employees are companies' greatest asset and hence the key to organisational success (Guest, 1987). However, a study by Druker et al (1996) revealed that most construction companies are far from being 'learning companies' approach with considerable scope to rethink and advance their approach to employee and career development. Another important findings of Druker et al was that the management of organisational culture and communications has not been very visible, and received little comment from their survey respondents, although questions of employee communications and employee involvement were highly rated as future areas of personnel activity. In essence, their findings concluded that "construction is managed by people who are concerned with cost and production. They are more influenced by the value of 'harder'

personnel issues and it is a challenge to achieve credibility for 'softer' issues". The 'harder' approach is that it puts the main emphasis on strategic business objectives and treats "human resources" like any other factor of production without according it an a priori central status in achieving competitive advantage (Fombrun et al, 1984).

From the above discussions, relating to environmental, technological, and social influences, it is argued that the social system of an organisation (which deal inter-alia with employees' relation, hierarchies, authority, and training and development), and other systems as such 'technical' and 'management', should be effective in order to efficiently respond to continual changing demands of the construction industry. The following section discusses the social system of a construction organisation and related problems.

2.4 The system of the construction organisation

There are many definitions of what a system is or what it constitutes. A system may be defined as "a whole having parts in a definable arrangement. The parts which are included are those in which the relationship is definable by the analyst or observer as having a relevant dependency. By including or excluding parts a boundary is identified, those parts not being included forming the relevant environment of the system" (Harding 1985). Newcombe et al (1990) describe a system in terms of its components: any group of entities which are functionally interdependent can be called a system. Any group of entities which are interrelated so as to perform some function, or reach some goal, can be seen to be acting as a system. Broadly, a system can be viewed as open and closed (Newcombe et al, 1990; Pilcher, 1992). An open system is one in which the system has free interaction with the environment within which it exists. A closed system is one that operates in a specified way with a given output from a specified input, either under conditions in which it cannot be influenced by a changing environment or within a strictly

specified and constant environment which is taken into account in the design of the system. Many mechanical and electrical systems are closed systems because they are designed to operate only when all the conditions related to them are available and unchanged by external influences. Organisations (construction) should be viewed as open systems for they deal with the environment (Harding, 1985; Newcombe et al, 1990; Pilcher, 1992) as follows:

- Construction organisations receive inputs in the form of people, materials, finance and equipment. These inputs may be received from individuals or other organisations (say subcontractors or suppliers).
- The construction organisation transforms the inputs, using various conversion processes (say actual construction at site) which involves interaction with many other participants including the client, subcontractors, consultants, and designers.
- The output of the construction organisation may be completed projects, behavioural aspects by firm's employees expressed in attitudes to the company, or action against the organisation.
- Information in the form of intelligence which provides signals about their environment and organisation's position in relation to that environment.
- Market differentiations such as civil engineering, building, housing, and property development.
- Construction business strategies differentiated by business diversification, acquisition strategy, internal activity and internal versus external growth.

The above influences on a construction organisation have been discussed in detail in previous sections, emphasising that construction organisations should be more organic (against mechanistic) in nature, to deal with constant changing demands of the industry. Since construction organisations deal with these influences, according to Harding (1985) they can be seen as: a management system; a production system; an economic system; a

people system; a communication system; an information system; a control system, a political system; a technological system; a professional system; a market system; and an authority system. However, all of these comprised broadly of five interlocking systems: *strategic; structural; social; information; and management* (Newcombe et al, 1990; Thompson, 1967). Many components and forces (changing economic nature, technology, social strategies, etc., as discussed in previous sections) act upon the construction organisation, and this interaction between the organisation and its environment determines appropriate systems (five types of systems as above).

The *strategic* system performs the task of managing the long term direction of the construction organisation. This system receives input in the form of market intelligence, assessments of organisations' current capabilities and internal and external stakeholders' attitudes. These inputs feed a conversion process which decides objectives, generates optional strategies, then evaluates, selects and communicates these strategies. The outputs of the strategic systems are strategic, administrative and operational decisions to facilitate the strategies.

The inputs to the *structural systems* are environmental and organisational characteristics, current activities and stakeholder attitudes, using which the system seeks to divide up or differentiate the work of the construction organisation, and to integrate or co-ordinate the activities involved. The outputs will be a formal organisational structure together with a complementary culture.

The *social system's* sole input is people of various types and levels. Through the process of motivation, group formation, leadership, and communication, the system seeks to achieve an output of satisfied, committed and involved personnel.

The *information system* will collect, sort, and disseminate information from sources external to the business, together with data from inside the firm, to the other systems in the form of time, cost, quality, resource and statutory data.

The management system is central to the whole organisational system. It occurs at three levels in the construction organisation - strategic, business, and operational - each with a distinct function. The functions being undertaken within the management system of construction organisations are briefly discussed in section 2.2.1. The outputs of the management system are primarily decisions and actions, but providing a motivating environment to facilitate the implementation of decisions is equally important.

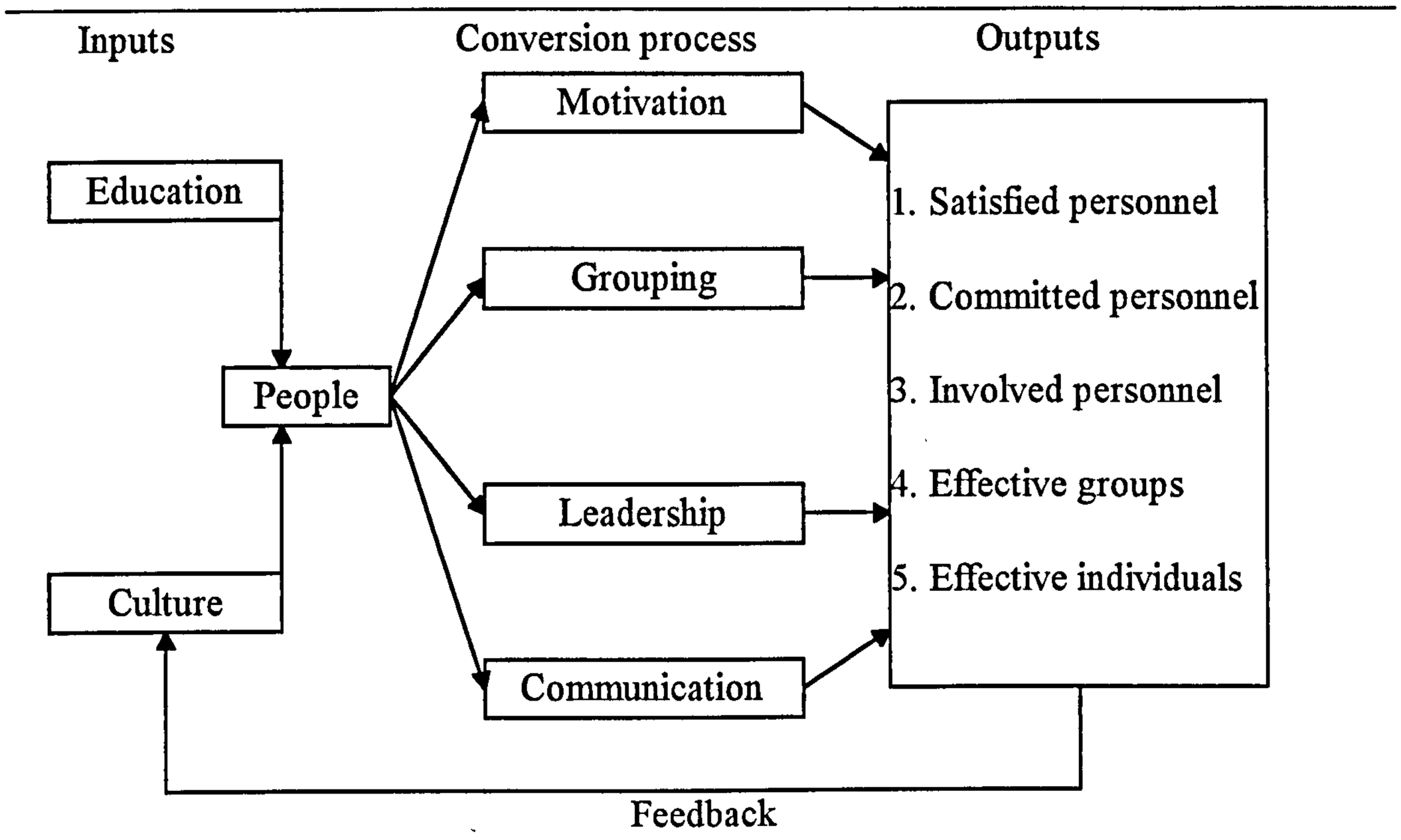
It can be seen from the above descriptions of each system, all are interlinked with each other and contribute to each other. The management system operates within a context comprising environmental, strategic, structural, information, and social systems. Discussing how they relate to each other and how they contribute to improvement amongst each other is beyond the scope of this chapter. However, for the purpose of this research, the following section discusses the social system of construction organisations.

2.4.1 The social system of the construction organisation: Theory versus practice

According to Newcombe et al (1990), the primary task of the social system is: to ensure that the work of the people within the organisation is carried out effectively and meets employees' aspirations. The model of a social system of construction organisation as produced by Newcombe et al is shown in Figure 2.3. As can be seen in the figure, there are three inputs to the system: people, the primary resource; the industrial (construction) culture within which people work; and the patterns of education and training which people bring to their work. The system, using these inputs converts into outputs classified as a

social product with satisfied, committed and involved personnel along with the product of group working (teamwork). The conversion processes include the way in which such people are motivated, the way in which they are grouped, how they are led and the quality of the communications within the system. The *people* element here refers to the directly employed sector of the construction organisation.

Figure 2.3: A systems model of the social system



(Adopted from Newcombe et al, 1990)

Both *culture* and *education and training* elements play a crucial role in people's attitude and subsequent involvement and commitment to their work. Education and training performs two critical functions: i) it assists in forming and constantly reinforcing the cultural norms of the construction industry; and ii) it updates employees' knowledge and

skills in the work environment, and thus eliminates the behaviour of *organisationally induced helplessness* among employees. Organisationally induced helplessness is one of the attitudes of employees who feel incapable of, or reluctant to performing newly introduced technology or tasks that affect performance of employees. On the other hand, the conversion process of the social system including motivation and methods, appears to be culturally influenced. A study conducted by Handa and Adas (1996) revealed that a high level of organisational effectiveness indicated by a high level of performance is associated with: a strong culture that promotes a high level of participation in decision making processes by its workers; a high level of positive attitude toward change by management and workers; a high level of planning as a strategy to adopt to environmental risks; and a high level of multiproject handling ability and a moderate level of using rules and regulations by the firm. This has also been confirmed by a previous study by Ostroff and Schmitt (1993), which indicated that effective and efficient organisations are influenced not only by strength of culture, but also by other variables such as participation in decision making, goal emphasis, attitude towards change and level of structural contextual emphasis. These two studies emphasis a culture of empowerment of employees coupled with a positive attitude towards change by both management and employees in order for organisations to be effective. In achieving this, the human relations model as developed by Handa and Adas emphasises flexibility and internal focus, with cohesion and morale as means and skilled empowered employees as ends.

Motivation is the physiological and psychological drive of individuals to obtain the means of satisfying their needs. If the needs are identified accurately, then the appropriate environment can be provided and the employee will be properly motivated (Pilcher 1992). Maslow (1970) identified a hierarchy of needs consisting of five levels: physiological; safety or security; social; esteem; and self-actualisation. Pilcher stated that the two lower levels (physiological and safety or security) can be satisfied by providing satisfactory

financial awards such as good wages, supplementary benefits like pensions, health, holiday pay and some protection from dismissal. The three higher level needs tend to be satisfied by job attributes such as independence of action, increased responsibility, recognition and public endorsement of success, a challenging job, creative task demands, a high status job title, and freedom in decision making. In supporting this statement many experts (Kanter, 1989; Rosenau, 1992; Turner, 1993) emphasised that *achievement* and *recognition* are the most powerful motivators, which included: employees' belief in the importance of their work; proactivity emphasising the achievement of results rather than fulfilling roles; encouraging employees to share in the entrepreneurial culture; providing opportunities to increase their learning experiences; and ensuring subordinates receive due recognition. Implementing the aforementioned factors for successful motivation needs further investigation in the managerial style of managing people and process. Douglas McGregor (1966) identified two managerial styles: Theory X and Theory Y. Theory X is an authoritarian style, in which top management makes decisions and coerces workers to comply. Theory Y is the participative style, built up on findings that people enjoy working and want to work. It assumes useful controls are within individuals and managers can draw upon workers' self-direction. In this style, the people are self-motivated to achieve the business objective. Thus, in a construction context, this again calls for employee empowerment. In the UK, people have worked well whilst unsupervised particularly if a more relaxed Theory Y approach has been applied giving them more control of their task (Neale, 1981; Sykes, 1969). In the USA investigations have concluded that if operatives could decide how to tackle a task the output was increased (Borcherding and Oglesby, 1974; 1975).

The other factors of the conversion process of the social system including teamwork, leadership, and communication are interlinked with each other, and all facilitate in effectively implementing the most effective motivational concept as suggested above - the

concept of empowerment. These factors are described in detail in Chapter 5. The complexity, dynamic, and uncertain nature of the construction environment demands many professional, specialists and experts to be involved in solving problems. Solving such complex problems is beyond the capabilities of any one individual. Oakland (1994) argued that the only efficient way to tackle problems is through the use of some form of teamwork, because problems that are exposed to a greater diversity of knowledge, skill experience are solved efficiently. Pilcher (1992) suggested one solution in that individuals carrying out similar processes or work tasks can be grouped together in departments or similar subsystems, hence an organisation structure can be created. On the other hand, effective management of groups or the business depends upon the leadership qualities and the type of leadership exercised by those responsible. Implementation of Theory Y principles of motivation (see above) seeks a participative and proactive style of leadership (see Chapter 5). All of the above factors of the social system, in essence, require an effective communication system to be in place throughout the organisation, because in a dynamic environment, employees need timely, accurate information in order to make decisions which affect the quality of their work.

Investigation of the literature indicates that the social system described above seems to be lacking in the current practice of construction organisations. Newcombe et al (1990) stated that Theory X is too often applied lower down, and that also too often poor planning, lack of materials, bad bonusing and so forth, have combined to frustrate employees in their attempts to do good job. These were the consequences of, as was seen in earlier sections of this chapter, the attitude of management, i.e. that employees are like any other factor of production and thus employees' input to business improvement are secondary. This indicates that the construction industry is still entrapped under the principles of Theory X, contradicting the adoption of the Theory Y emphasised by the literature. However, studies by Hillebrandt et al (1990; 1995) identified that companies

are keen to have (and some attempt to have) a participative style of management with relatively flat pyramid structures. However, the reason for their not being effective in practice may be because, as perceived by Hillebrandt et al, the lack of knowledge of the relevant concepts and theories by managers, to the organisation structure and behaviour of construction organisations. In addition, investigation by Hillebrandt et al evidenced that many companies revealed failures to plan adequately for management progression and to appreciate their changing nature of the skills which they (would) require. This shows that employee training and development, which is essential for the effective functioning of the organisational social system, receives scant attention. Moreover, construction organisations do not seem to have developed systems as a single entity for managing their business activities. Research by Fisher and Yin (1992) revealed that a majority of firms had developed their systems in an incremental add-on manner and had not looked at a system as a single entity (with its ensuring productivity benefits). To conclude, the current status of construction organisations calls for a detailed study of employee participation and skill development, in striving to improve the effectiveness of such organisations.

2.5 The historical development of construction management process: lessons from manufacturing

Since the industrial revolution, the construction industry has followed the path of the manufacturing sector in adopting new principles of management processes. Manufacturing has perpetuated itself in developing and reorganising work processes and supply chains in order to improve business performance. As a result, constant change with respect to customer demands and corresponding receptiveness in the organisation has become a way of life. Traditionally, both manufacturing and construction businesses revolved around 'craftswork' principle. That is, several craftsmen were employed to perform small, specific items of the business. The cost of production contributed to the

development of the assembly line process, supported by expensive automation to produce a high volume of products at lowest cost. This process is often called 'mass production'. This system required extra money, machines, and space to assume smooth running. However, the system was not able to achieve all of its objectives, for example, the following problems pertained: inability to respond to the changing demands of customers; dictated workforce (i.e. workforce were dictated what to do); workforce reliance on management; and delayed product delivery (Womack et al, 1990; Koskela, 1992). Eventually, a new way of creating efficient systems was essential, which resulted in the development of 'lean' manufacturing principles, that rapidly changed the manufacturing industries into one of being more progressive in delivering high quality products. The following sections discuss problems and weaknesses of reliance on both craftwork and mass production philosophies and highlights the potential benefits, if construction organisations were to adopt the lean production philosophy (which is based on the concept of empowerment).

2.5.1 Craftwork philosophy

The ancient process of constructing a building was dominated by heavy masonry works, the composite construction was rare. As a result, masons were the principal craftsmen. Centred around them, other craftsmen such as carpenters and painters were organised to complete the facility. Several masons were employed to perform specific items of work and that they were highly specialised in their speciality areas. According to Goetz (1982), the master mason was appointed by the client and had to function in many capacities: architect; administration; official; contractor; and supervisor. The head mason designed the building , and designed moulds, doors, windows, and arches. There were several arrangements within this system, for instance, masons did not always work on their own plans and designs, but also worked for plans prepared by other masons (Warren, 1907),

and sometimes materials were being supplied by the mason instead of the client. This trend continued until the late fifteenth century. A similar approach was employed when automobiles were first manufactured during the late nineteenth century. A workforce that was highly skilled in design, machining, operations, and fitting was engaged to build a car. Craftsmen skilled in their own specific areas have served as independent contractors within the assembler plant as independent machine-shop owners with whom the company contracted for specific parts or functions (Womack et al, 1990).

Within this craft-based approach, a great deal of benefit were apparent. First, design/construction integration; the craftsman did perform both the design and construction of a building. This is the primitive approach of the current 'design and build' system. Second, work processes were extremely decentralised, which led craftsmen to enjoy full authority and control over their processes. The whole system, in turn, was co-ordinated by the client, or on the client's behalf, by the head craftsman. This system was best suited to the construction process, because of one-off nature. Unlike construction, manufacturing had faced detrimental affects by the use of craft production. Manufacturing is repetitive; the bulk of cars are built to the same design for several years until the design is changed into the next model. Any two cars produced for the same design should be identical in both size and performance, there may be little variation. Since craftwork cars are handmade, managing high precision for producing identical cars is impracticable. In craft production, the cycle time is constantly increased, there is often an imbalance of (increased) market demand and delivery capability. This one-off-nature production to automobiles did not match with their process, and in turn, increased the cost. Some of these problems are also applicable to the construction sector. The craftwork concept applied to construction processes have always been sequential, where, concurrent approaches were obsolete, which often impeded on-time completion. Communication links between different craft areas tend to be tenuous. Individual

craftsman did not have enough resources to pursue innovation in construction methods. Consequently, the overall cost of production increased.

2.5.2 Mass production philosophy

The inherent nature of the craftwork concept and its inability to produce cost-effective products led the manufacturing industry to embrace the concept of mass production. Aims of the mass production system were to: reduce product variability and increase consistent interchangebility of parts and the simplicity of assembling them to each other; and increase the rate of production using highly specialised machines so as to reduce the cost per unit. The mass organisation had to build all fundamental resources so as to obtain the needed raw materials, services, and so forth from internal operating divisions co-ordinated by senior executives at corporate head quarters (Womack et al, 1990). This created a complex organisation with a diversed environment, which in turn created number of job categories and extra professions such as financial management, marketing, industrial engineering, and production engineering. This formed a strong vertical hierarchical organisation. The mass production system was based on the development of 'scientific management' by Frederick Taylor in the late nineteenth and early twentieth centuries. According to Taylor's theory, it is the responsibility of management to determine the one-best-way of doing business (Maloney, 1995).

Workers were instructed on what had to be done and how to perform their tasks. This created little control and a concentration of workers over their work processes. Mass production is totally a reciprocative system of the craftwork concept, consequently, there is a significant reduction in the involvement of the workforce. Design was separated from construction (production); this being perceived as the domain of the senior management (and its design team). In this regard, the construction industry has preceded

manufacturing; the practice of design/construction separation had started during late sixteenth century (Knoop and Jones, 1936; 1937). Plans were prepared by persons other than masons (later on called architects) and the function of construction was performed by masons. When construction projects became more complex and larger (requiring a large volume of labour and materials), and plans became highly complicated, then masons were simply unable to manage themselves. Hence, masons became established organisations called as contractors (construction organisations). The trend of the architect being the principal designer, the contractor being the constructor, and clerks of works being supervisors of the erection on behalf of the client, has continued for the past three centuries. That is, until there was realisation of the negative consequences of design/construction separation during the early sixties (twentieth century). Several government reports such as Emmerson (1962) and Banwell (1964) have focused on this problem and have sought for design/construction integration. Consequently, the design and build systems were developed, where construction organisations assumed a variety of tasks to manage both design and construction. Various forms of procurement systems (Traditional, Design and build, Management contract, and Construction management), are typical examples of the mass production philosophy. These procurement systems have achieved, to some extent, a production input into design. However, they have failed to incorporate the advantages of the four hundred years old craftwork concept, i.e. *workers involvement in and their control over the work processes.* Rather, these modern procurement options advocate centralised top-down decision making and workers performing prescribed tasks. This demonstrates the separation of 'thinking' and 'doing'.

2.5.3 New Construction Philosophy for construction organisations

The mass production philosophy discussed above, has resulted in many problems including: a strong vertical hierarchical organisation where all of the necessary inputs to workers are determined by the top management and passed on to them through several layers; work processes are determined by management experts and workers have to simply follow the procedures they are told; work processes are sequential, which require highly specialised workers to perform a particular piece of the process; defective products/information are allowed to pass through several phases of production until rejection at the end. These problems could not have been solved despite the usage of advanced computer-driven automation and information technology. The craftwork concept is preferable to achieve labour-directed quality control and design/construction integration. However, ever increasing technology and construction methods would not fit into the craftwork concept, hence it is obsolete in attempting to solve these problems also. The ultimate solution has to be a fundamental rethink in the way both people and processes are organised in traditional systems, to produce a better system that eliminates/reduces non-value adding activities in the production process. The manufacturing revolution that took place in Japan (Toyota) during the fifties realised this solution and introduced radical approaches in the 'assembly-line' and 'supply-chain' process of manufacturing automobiles (Womack et al, 1990). Taiichi Ohno and Kiichiro Toyoda of Toyota were successful in producing small batches of automobiles at a unit cost of less than that achieved by the mass batch concept of the US automobile giants (Ford and GM). This new philosophy was later termed 'lean manufacturing'. An assembly-line is the process of assembling thousands of parts into completed cars through several processes in the line of production. To some extent, the construction process of a building can be referred to as an assembly process (Bon , 1991; Fisher, 1993). The

production of materials and components that are assembled in the building process takes place mainly in manufacturing.

In the craftwork system, the skilled craftsman obtained tools from the tool room, performed the complex assembly for the entire vehicle, and finally checked the product completely before distributing it to customer (both internal and external). However, in mass production, craftsmen did not have to inspect for quality nor did not even know what the internal customer and supplier were doing. In the previous case (craftwork), workers had the opportunity to control the quality of their performance, so that defects were checked before the product reached the next customer, but cycle time and costs per unit were increased. In contrast, the latter system (mass production) enabled workers to pass on defective outputs to the customer, but reduced the cycle time and costs. However, in achieving both the labour-based quality control, and reduced cycle time and costs, a solution was discovered and implemented at Toyota, where several teams were organised on the assembly-line with a leader for each team, and were given a set of assembly steps, their 'piece' of the line. [In construction organisations, individuals carrying out similar processes or work tasks can be grouped together in departments or similar subsystem within an organisation structure as suggested by Pilcher (1992) as one solution]. The team leader had to perform assembly tasks as well as co-ordinate the team, and in particular, filled in for any absent worker (Womack et al, 1990). Teams were given the job of multi-disciplinary works including house keeping, minor tool repair and quality-checking. If a problem emerges within their piece of the assembly line, the whole team should come over to work on the problem. This system has completely eliminated the external inspection and greatly reduced the cycle time and costs. In essence, the system largely transfers maximum number of tasks and responsibilities to those workers actually adding value to the car on the line, and advocates teamwork among line workers for sharing of knowledge and information to continuously improve their own process.

This new production concept, originated around the quality principles taught by American Gurus such as Deming (1982), Juran (1988), and Japanese New Production system (NPS) Research Association (Shinohara, 1988). The fundamental theme of the new production philosophy as stated by Koskela (1992) is briefly presented as follows.

A production process consists of conversions and flows. The conversion process involves conversion of an input to an output. In other words, processes which transform materials into fully or partly completed products (e.g. concreting, welding, and formwork, etc.). Efficiency of this process directly adds value to the customer (internal or external). Flows are flow of materials and/or information from raw state to completed state. In this flow, the material/information is processed, inspected, and moved on to the next stage. Inspecting, moving, and waiting for approval represents the flow aspect of the production. The flow process supports the development of products (conversion) from one stage to the other. The activities related to the flow process do not directly add value to the customer, hence, they should be reduced, eliminated, or optimised to efficiently bind the conversion activities together.

In order to increase the efficiency of both the conversion and flow processes, the concepts of employee empowerment and lean management have been suggested by many experts (Womack et al, 1990; Koskela, 1992; Smack et al, 1993). Womack et al stated that they transfer the maximum number of tasks and responsibilities to those workers actually adding value to the product on line, and inherently possess a system for detecting defects and consequent problems. Authorising every employee to be responsible in this way makes each employee simultaneously an *inspector* and *processor* of their own work. Consequently, this approach might greatly reduce and/or eliminate unnecessary procedures (non-value added activities) and improve efficiency of flow activities. This requires: commitment of both management and workforce in improving the process of

conversion and flows; a participative leadership style; flattened organisational structures; self-directed teamwork; continuous (skill) education of employees; and measurable improvements (Avrick et al, 1992; Baker, 1993; Maloney, 1995; Shay et al, 1991; Steiger, 1994; Tener, 1993). These principles may be applied to any organisation, including construction. Literature (Congram and John, 1993; Kimple et al, 1991; McDermott, 1991; Murray and Hines, 1994) indicates that other progressive industries such as service industry, process and education, have successfully implemented the concept of empowerment within their organisations and achieved dramatic improvements. However, literature (Koskela, 1992; Lover and Mohamed, 1995) suggest that the construction industry has shown little interest in adopting these principles. Investigation of construction, manufacturing, and service organisations in the UK revealed that there has been an overwhelming interest within construction organisations for implementing empowerment. However, in comparison with the manufacturing and service sectors, construction is very much behind in implementing this concept (Hammuda and Dulaimi, 1996). Since construction organisations are largely controlled by professionals, the same system as discussed above cannot readily be applied. This may be due to several reasons; predominently, construction (main) contractor organisations largely act as a business organisation which, unlike manufacturing, does not fully undertake the actual construction process at site with a permanent workforce. However, the basic principles that underline them can be considered for improving the performance of construction organisations. After all, the fundamental business objective of construction organisations is construction of facilities (which involves the production of constructed facilities). Construction organisations adopting the lean characteristics would enable them to overcome from the traditional problems of mass production principles. The earlier sections of this chapter emphasised the need for incorporation of these principles in order for construction organisations to effectively respond to the three fundamental organisational influences (i.e. environmental interactions, technology, and psycho social).

2.6 Summary

This chapter has analysed current systems of the construction organisation in terms of two facets: the internal structure of construction organisations; and lean management principles (that are prevalent in the manufacturing sector). Construction organisations are perceived to be influenced by three major factors (environmental; technological; and psycho social) which seek construction organisations to be more organic in nature so as to effectively cope with the changing demands of these influences. This organic nature emphasised that organisations should be: reasonably flatter in structure; employees be continuously trained or educated for changing demands in skill; and employees' participation in decision making is vital (these are the essential features of lean management principles). However, the current trend in construction organisations appears to be largely based on conventional principles where: organisational structures are more vertical and hierarchical (although some companies are committed to continuous training and employee development programmes there appears to be lack of an efficient training system that offers better training to employees); managers do not act as leaders in effectively leading subordinates towards achieving the business goals; employees' participation in business improvement is considered secondary; and organisational systems are developed on an incremental add-on manner instead of developing them as a whole, single entity. All of these symptoms indicate that the social systems of construction organisations are inefficient in effectively addressing the business needs of their environment. In advocating improvement of the performance of the social system of construction organisations, this chapter highlighted the potential for incorporation of the concept of empowerment. The next chapter will go on to discuss the principles of the modern empowerment concept.

Chapter Three

An Alternative to the Conventional Approach: The Modern Empowerment Concept

3.1 Introduction

Empowerment is an emerging construct used by both management and social science theorists to address issues as such organisational effectiveness, powerlessness, and motivation. There has been a growing concern expressed in the literature (Leana, 1987; Conger and Kanungo, 1988; Hammuda and Dulaimi, 1996) that the notion of empowerment and its theoretical rationale for related practices are inadequately understood by both practitioners and theorists. Against this backdrop, this chapter critically reviews the basic constructs of empowerment and related models proposed by theorists. Finally, the chapter identifies the fundamental components (elements) that have to be addressed for successful implementation of empowerment; this serves as basic propositions for subsequent investigation in this research.

3.2 Empowerment defined

The term 'empowerment' has been used in different ways; some refer to it as 'total employee involvement', 'continuous learning', 'management by participation', 'delegation', and others as 'self-directed work teams'. The following are some more detailed definitions of empowerment:

- Ripley and Ripley (1992) define empowerment in four dimensions: as a concept; as a philosophy; as a set of organisational behavioural practices; and as an organisational

programme. As a concept, empowerment is the vesting of decision-making or approval authority to employees where, traditionally, such authority was a managerial prerogative. Empowerment as a philosophy and set of behavioural practices means allowing self-managing teams and individuals to be in charge of their own career destines, while meeting and exceeding company and personal goals through the shared company vision. Empowerment as an organisational programme involves providing the framework and permission to the total workforce in order to unleash, develop, and utilise their skills and knowledge to their fullest potential; for the good of the organisation as well as for themselves.

- For management, empowerment is the giving up of some control and the sharing of additional knowledge of company goals and achievements. For employees, it is acceptance of the risk by taking more responsibility (Loretta and Polsky, 1991).

- Empowerment refers to leadership approaches that enable employees to take ownership of their jobs, so that they choose to involve themselves in constantly improving the performance of the organisation (Tener, 1993).

- Empowerment means giving employees authority commensurate with their responsibilities to initiate positive change in their organisation. This demands total commitment, involvement, support, and trust from management (Avrick et al, 1992).

- Empowerment means every individual is responsible for : acceptance or rejection of the quality of prior work; self-inspection and control of current work; and acceptance or rejection of finished work (Rubinstein, 1993).

- In contrast to the above practical definitions, Conger and Kanungo (1988) define empowerment as a process of enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and informal techniques of providing efficacy information.

The first four of the above definitions, collectively, lead to define empowerment as "the process of giving employees the authority to take decisions, relating to their work processes and functions within the limits provided by their management, but, requiring them to assume full responsibility for their actions". However, using this definition may inhibit consideration of other facets of empowerment (e.g. involvement, personal efficacy, teamwork) that are attributed to the powerlessness of employees. (This issue is discussed in detail in following sections). This seems too constrictive in scope to accommodate the complex nature of empowerment. However, the definition forwarded by Conger and Kanungo, as stated above, seems more generic and reflects the complex nature of empowerment. Thus, it is considered as the constitutive (definitive) definition of empowerment for this research. A similar conclusion was arrived at by research conducted by Hammuda and Dulaimi (1996).

Investigation of companies including manufacturing, construction, and service organisations by Hammuda and Dulaimi (1996) stated that despite the general meaning of empowerment, organisations seem to differ in their understanding and implementation of the empowerment concept. Some companies consider it as employee participation to achieve quality and customer satisfaction, or as a limited power and authority delegated to employees. Others understand empowerment as being a step forward to high involvement and more than just a delegation. This clearly shows the confusion that exists amongst users of empowerment on the level of delegation of authority to, or participation by,

employees in an empowered organisation. Another feature observed from the above definitions is the issue of powerlessness of employees. It is understood from those definitions that elimination of powerlessness through appropriate motivational techniques (including participative leadership, process ownership, and skill development) empower employees to handle their own processes. The two important techniques (to remove powerlessness) that have been constantly analysed and reviewed by human resources researchers are *participation* in decision making and *delegation* of authority to make decisions (Leana, 1987; Locke and Schweiger, 1979). Contrasting views exist on both the use and relevance of these two techniques in implementing empowerment (which are discussed below). The following section describes *participation* and *delegation* and distinguishes their characteristics in the context of their use in an empowered environment.

3.3 Participation and Delegation

A series of research into organisational behaviour, relating to involvement and employee autonomy in decision making, have been undertaken when the concept of Participation in Decision Making (PDM) was in vogue. Much research has tended to focus exclusively on comparisons between joint decision making and autocratic arrangements [i.e., in which subordinates are not included in any aspect of the decision making process (Leana, 1987)]. Most of the research on decision making has investigated the effectiveness of PDM and non PDM (autocratic) approaches in organisational settings. Some (Kuriloff, 1963; Marrow, 1966; Latham and Yukl, 1975) have found PDM as more effective in achieving employee satisfaction and increasing productivity, whilst some have not (Torrance, 1953; Seashore and Bowers, 1963; Lischeron and Wall, 1975). The conceptual and operational differences between participation and other forms of decision making (delegation), which would assist users to use them in the right environment, and at the right time, have been addressed little in the literature (Leana, 1987). In order to understand implications of

these decision making processes on the concept of empowerment, this section reviews different models of participation and delegation and compares and contrasts them, for relevance to the empowerment concept.

3.3.1 Participation

Participation can vary in scope, content, and degree. It can also be formal or informal, and forced or voluntary (Locke and Scheweiger, 1979). Research on participation is itself quite diverse and plagued with inconsistencies concerning both the definition and the implementation of participative decision making processes (Schweiger and Leana, 1986). PDM can take many different forms ranging from subordinate consultation through superior-subordinate decision making, to participation through subordinate representation (Leana, 1987). These variations suggest that the practice of PDM has a continuum within which the degree and nature of participation varies according to the suitability of different users. Despite these variations, participation has commonly been operationally defined by researchers as joint decision making between superiors and subordinates (Bass, 1981). However, several experts (Sashkin, 1976; Lowin, 1968) suggest that participation takes various forms, including the type of participation (individual, dyadic, and group) and the nature of the task on which participation is made (e.g. problem solving, process improvement, goal setting). Several models discussing the type, mechanism and effectiveness of PDM are discussed below.

A causal model of PDM as developed by Sashkin (1976) identifies four forms of participative approach being applied in organisational settings: 1) participation in goal setting; 2) participation in decision making; 3) participation in problem solving; and 4) participation in the development and implementation of change in the organisation. Three modes or methods of participation have been identified; i.e. individual, dyadic, and group.

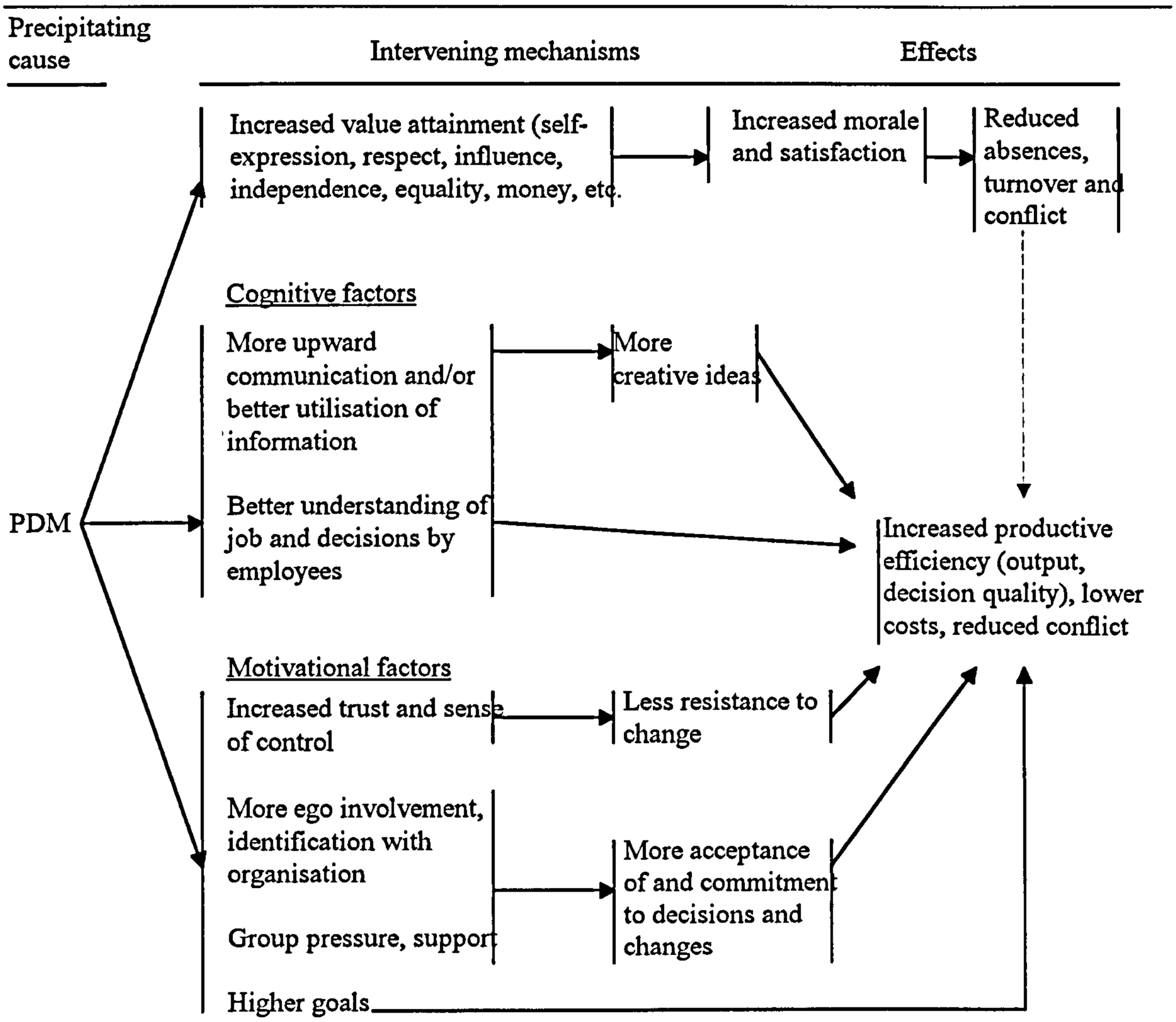
Finally, the model provides a series of causal effects of contingency factors [psychological contingencies (values, attitudes, and expectations) and organisational contingencies (complexity, differentiation, technology, competition, governmental change)] on four forms of participative approach within the three different modes. In essence, both contingencies favour participation. Taken together with the obvious and increasingly rapid factor of business environmental change, effects of contingencies suggest that participative approaches will be increasingly useful. In addition, Sashkin provides the change processes for various participative approaches and methods. When any of the four participative approaches is the aim of change, a congruent, participative change process would be required. As of particular interest to this study, the four participative approaches and the three possible methods of operation of each approach, with a brief description of one possible congruent change process, as provided by Sashkin, is shown in Table 3.1. It can be seen from the table that individual methods of participation, means that individuals are fully empowered to set goals, produce plans for problems and change methods. In the other two methods either they work closely with their superiors or become involved in a group in performing relevant tasks of the four approaches. However, all of the processes emphasise training as a first step towards change. In essence, the concept of PDM can be seen as one of the various forms of participative approaches, which can be used upon employees either on an individual or group basis.

Table 3.1: Congruent change processes for various participative approaches and methods

Approach	Examples of congruent change processes using		
	Individual method	Dyadic method	Group method
Participation in goal setting	Individual training in goal setting by experts The individual participant determines goal setting boundaries and goals for the change-over to participative goal setting.	Supervisors learn the goal setting process and educate subordinates. Superior and subordinate jointly define goal setting boundaries and determine goals for change-over	Supervisors work with their own subordinate group to train them in goal setting Group, including supervisor, determines limits of goal setting, confining process to group level goals (not individual-behavioural), and sets goals for change
Participation in decision making	Individual training in decision making, by experts; variety of training choices offered to individuals Individual selects areas from prepared lists, deciding which areas will be used for individual decisions	Supervisor and subordinate consult and choose training method from prepared list of alternatives Supervisor and subordinate jointly review decision areas and select those for emphasis in operation of PDM	Work group selects training method from prepared set of alternative choices Group decides which of several alternative decision making areas are to be subject to participative decision making
Participation in problem solving	Individual training in problem solving, by experts; individuals (especially managers) participate in design of training Individuals determine own plans for application of problem solving to job, defining "area of freedom"	Superior and subordinate are trained together, by experts, participating jointly in training design (e.g. assessment of joint training needs) Superior and subordinate jointly make plan for use of dyadic problem solving, defining problem areas and methods of joint problem solving work on a regular basis	Work groups are trained together, participating in developing training design Group makes for operational use of problem solving, defining problem areas of group relevance and methods (e.g. regular meeting times; how to convene group for problem solving session, when necessary etc.)
Participation in change	Individuals are trained in change methods (e.g. work simplification), and at the same time observe process of their learning as a change process Individuals plan for application of change methods to own jobs	Superior and subordinate pairs are trained together in change methods, using training process as example of change process Superior -subordinate pair define joint change needs (e.g. regarding their work and work relationship), determine appropriate change methods and jointly plan for use of change process	Work groups are trained together in change methods, often including guided application of change methods to real work situation or to group interrelationships and functions Groups define areas for change work, and determine operating procedures for group change work

(Adapted from Sashkin, 1976)

Figure 3.1. Effects and mechanisms of PDM



(Adapted from Locke and Schweiger, 1979)

A model proposed by Locke and Scheweiger (1979) provides the effects and mechanisms of PDM (PDM is one of the four forms of participative approaches discussed in Sashkin's model). The model addresses, broadly, two major factors, i.e. cognitive and motivational, that influence upon the mechanism of PDM causing increases in productive efficiency (see Figure 3.1). Most of these factors are recognised by works of other experts (Lowin, 1968; Lawler and Mohrman, 1989). The model suggests the following points.

- A major cognitive factor is the increase in information, knowledge, and creativity that will allegedly be brought to bear on organisational problems as the result of PDM.
- The process of group decision making leads to better utilisation and integration of knowledge than individual or consultative decision making.
- Cognitive factors involving greater understanding on the part of the employees who are to execute the decisions as such greater goal clarity, a fuller grasp of the methods to be used in accomplishing the work, understanding on the reasons for organisational changes, decisions, and policies results from PDM.
- Greater trust on the part of employees which results from being consulted about proposed changes reduces resistance to change.
- Increased acceptance of and commitment to changes or decisions (including goals) reduce resistance to change. This in turn has been attributed to a greater degree of ego involvement or identification with the organisation induced by PDM.
- PDM groups may set goals which are higher than those which would have been assigned by management.

In essence, this model introduces a number of both cognitive (more upward communication, better understanding of the job) and motivational factors (increased trust, more ego involvement, group pressure) to achieve higher productivity and employee satisafction.

3.3.2 Participation versus delegation

Although participation or PDM is commonly understood as either a dyadic or group decision making process (Locke and Schweiger, 1979; Bass, 1981), the participation model proposed by Sashkin suggests an individual participative approach (refer Table 3.1) where individuals decide everything related to training, decision making areas, problem

solving, change methods, and so on. This implies that individuals are delegated the authority to take decisions related to their own job. In essence, Sashkin's model of a participative approach cannot be considered as having the same meaning of *participation* as suggested by others (e.g. Locke and Schweiger, 1979; Bass, 1981). Sashkin's model treats PDM as one of the various forms of participative approach, where both individual method or dyadic and group methods can be adopted depending upon several contingency factors. The model, by having included the individual method, indirectly combines the concepts of both participation and delegation within the participative approach. Locke and Schweiger (1979) argue that there is nothing wrong with combining elements of these two concepts in practice. However, they are conceptually distinct (Susman, 1976; Vroom and Yetton, 1973; Leana, 1987). Delegation is a process whereby the manager transfers decision making authority to a subordinate (Leana, 1987). The differences between participation and delegation are summarised below:

- Participation finds its theoretical roots in a human relations approach to management that emphasises equalisation and social interaction (Leana, 1987; Heller, 1976). Delegation deals with cognitive growth or human resources approaches that emphasise the need for subordinate autonomy and individual development (Hackman and Oldham, 1976).
- Participation entails superior-subordinate collaboration in decision making. Delegation refers to the actual passing of decision making authority from superior to subordinate (Locke and Schewieger, 1979; Bass, 1981).

The above comparisons distinguish *delegation* from *participation* as tending more towards the first four definitions of the term *empowerment* as stated by different experts. That is, the process of giving employees the authority to take decisions, relating to their work processes and functions within the limits provided by their management, but,

requiring them to assume full responsibility for their actions (see section 3.2). This does not mean that the concept of empowerment precludes employee involvement in joint decision making (which is detailed in next section). Although some research (Leana, 1987) indicates that delegation results in superior performance of employees compared with the participative approach, no evidence has been found to say that, in practice, participation should not be applied accompanied by delegation. As stated by many experts (Heller, 1976; Hackman and Oldham, 1976; Locke and Schweiger, 1979) both have distinct characteristics in addressing two dimensions of human resources management: human relations and cognitive growth. The *participative* approach addresses development of good supervisor-subordinate relationships and cohesive work groups in order to satisfy both social needs and the needs of business demands. Whereas the cognitive growth advocates job enrichment through *delegating* individual responsibility in order to satisfy employees' needs to grow in their knowledge, efficacy, and individuality (Herzberg, 1966). The implications of both participation and delegation on empowerment can be observed in the models of empowerment discussed below.

3.4 Models of empowerment

According to Hammuda and Dulaimi (1996), it was not until the late 1980's and early 1990's that organisations and theorists started considering to give employees more involvement, autonomy and participation in decision making in a process which involves the individual, group, and the organisation as a whole. This radically changes the traditional shape of the organisation, and the role of managers, what is called 'empowerment'. There are several models of empowerment (e.g. Shay et al, 1991; Musselwhite and Moran, 1991; Congram and John, 1993) which relate to various organisational settings (e.g. service and manufacturing). These have been reported in the literature, but, conceptually, the process of empowerment has been addressed little. Since

the theoritical understanding of the concept of empowerment is critical for successful implementation in practice, some of these theoretical models are discussed as below.

The generic meaning of empowerment (as identified in section 3.2) suggests that the primary theme is enhancement of feelings of self-efficacy among organisational members through identification and removal of conditions that foster powerlessness. Conger and Kanungo (1988) identified several context factors (including organisational, supervisory, reward, and job design) that lead to powerlessness (see Table 3.2). These factors indicate that: bureaucratic contexts and authoritarian management styles encourage powerlessness by fostering dependency, negative forms of manipulation, less meaningful organisational goals, and poor communications. Furthermore lack of resources, poor job design, and poor recognition systems can also contribute to employee powerlessness. In order to address these factors and make employees feel self-efficacy, Conger and Kanungo advised to solve the negative management practices exhibited in Table 3.2. The context factors mentioned in Table 3.2 led to the following key suggestions:

- Organisations selection and training procedures should ensure requisite technical, linguistic, and social influence skills.
- Organisations that provide multiple sources of loosely committed resources at decentralised or local levels, that structure open communications, and that create extensive network-forming devices are more likely to be empowering.
- Leadership and/or supervision practices that are identified as empowering include: expressing confidence in subordinates accompanied by high performance expectations; fostering opportunities for subordinates to participate in decision making; providing autonomy from bureaucratic constraint; and setting inspirational or meaningful goals.
- Reward systems that emphasise innovative/unusual performance and high incentive values foster a greater sense of self-efficacy.

In essence, all of the above suggestions coupled with the context factors suggest concentration on various issues including:

- organisational system and structure
- communications systems
- leadership styles
- recognition of achievements
- job redesign; sufficient training
- participative approach
- delegation of authority to employees.

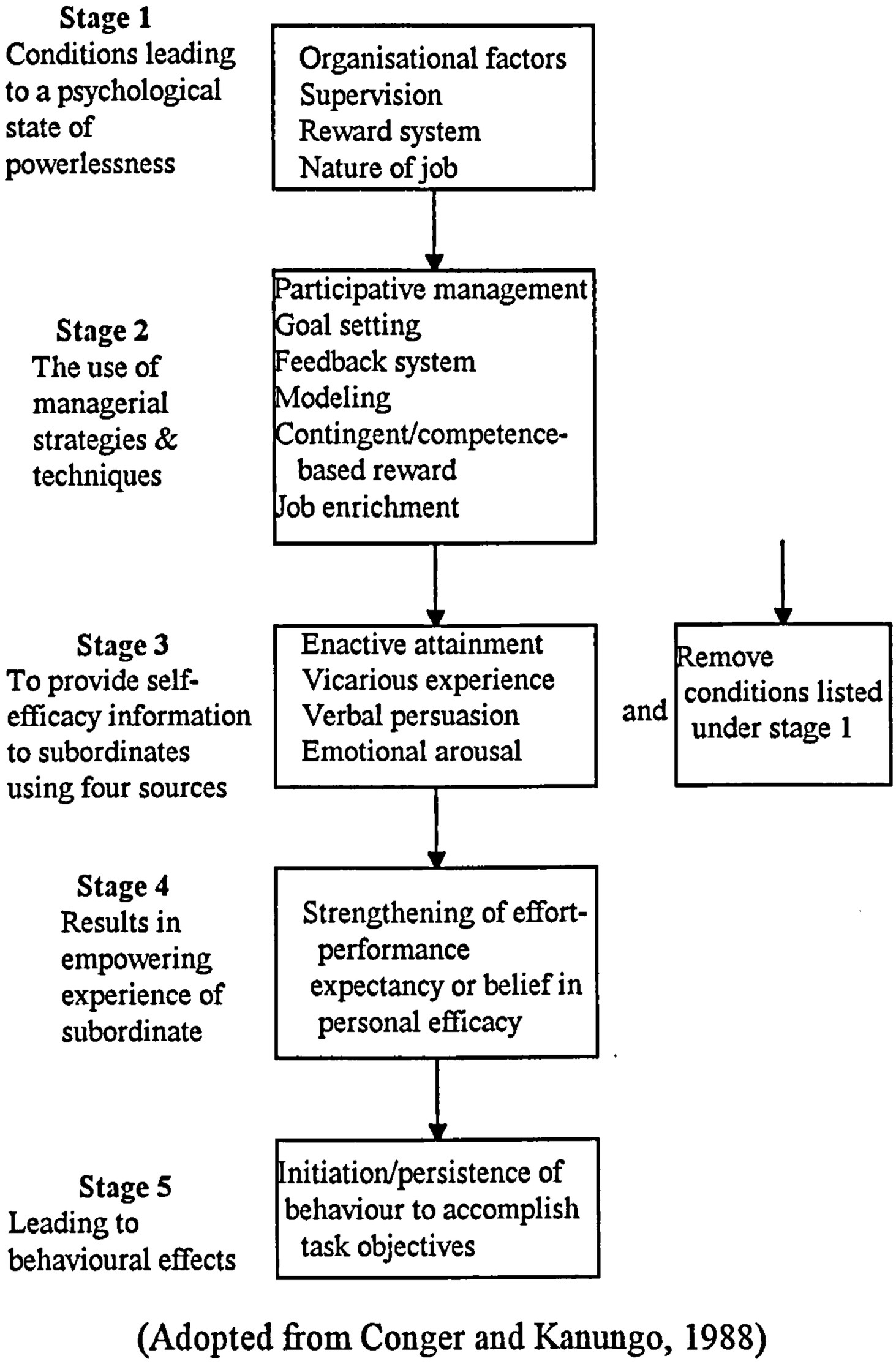
Table 3.2: Context factors leading to potential lowering of self-efficacy belief

Organisational factors	**Supervisory style**
Significant organisational changes/transitions	Authoritarian (high control)
Start-up ventures	Negativism (emphasis on failures)
Competitive pressures	Lack of reason for actions/consequences
Impersonal bureaucratic climate	
Poor communications/network-forming systems	
Highly centralised organisational resources	
Reward systems	**Job design**
Non contingency (arbitrary reward allocations)	Lack of role clarity
Low incentive value of rewards	Lack of training and technical support
Lack of competence-based rewards	Unrealistic goals
Lack of innovation-based rewards	Lack of appropriate authority/discretion
	Low task variety
	Limited participation in programs, meetings, decisions that have a direct impact on job performance
	Lack of appropriate/necessary resources
	Lack of network-forming opportunities
	Highly established work routines
	High rule structure
	Low advancement opportunities
	Lack of meaningful goals/tasks
	Limited contact with senior management

(Adopted from Conger and Kanungo, 1988)

In effectively providing such a feeling of self-efficacy and eliminating powerlessness, Conger and Kanungo (1988) provided a five stage process of empowerment (see Figure 3.2).

Figure 3.2. Five stages in the process of empowerment



(Adopted from Conger and Kanungo, 1988)

The first stage is the diagnosis of conditions within the organisation that are responsible for such feelings of powerlessness. This leads to the use of empowerment strategies and tactics (including as highlighted above) in stage two. The employment of these strategies is aimed not only at removing some of the external conditions responsible for powerlessness, but also at providing subordinates with self-efficacy information in stage three. The sources of self-efficacy information include: enactive attainment; vicarious experience; verbal persuasion; and an emotional arousal state. Information in personal efficacy through enactive attainment refers to an individual's authentic mastery experience directly related to the job. For example, information that enables subordinates capable of executing new tasks successfully at the initial stage, make them feel more capable. The feeling of being empowered can also come from the vicarious experiences of observing others in a similar situation (i.e. co-workers) who perform successfully on the job. Words of encouragement, verbal feedback, and other forms of social persuasion can often be used by leaders, managers, and team members to empower subordinates.

Finally, one's personal competence expectations are affected by one's emotional arousal state. Emotional arousal states that result from stress, fear, anxiety, depression, and so forth, both on and off the job, can lower self efficacy expectations. Empowerment techniques and strategies that provide emotional support for subordinates and that create a supportive and trusting group atmosphere can be more effective in strengthening self-efficacy beliefs. As a result of receiving such information, subordinates feel empowered in stage four, and the behavioural effects of empowerment are noticed in stage five.

Ripley and Ripley (1992) provided an empirical model which includes the empowerment strategies and activities to be undertaken by senior management, middle management, and direct work employees. The model suggests almost all of the strategies suggested by Conger and Kanungo (1988) for providing self-efficacy including appropriate leadership

(including empowered employees act as leaders at all levels of the organisation), training, recognition, resources allocation, customer focus, and team work. The empowerment leadership tends to adopt a style that includes vision, less control and more support, and involvement. The leadership provides required resources, a suitable organisational structure, goals, and necessary training. The model insists on a feedback loop mechanism of the empowerment programme, which includes: current organisational environment assessment; development of a quality improvement strategy (especially related to customers); assessment of education and training needs (and their implementation); implementation or phasing in of empowerment; and implementation of quality strategy. Other empirical models of empowerment (e.g. Shay et al, 1991; Congram and John, 1993; Avrick et al, 1992) also support the features described in the above two models (Ripley and Ripley, 1992; Conger and Kanungo, 1988). The continuous improvement empowerment model of Congram and John suggests management activities including vision, goals, communication, systems development, implementation strategies; measurement of progress; recognise achievements; and training. Employee activities include: input to goals, system design, implementation strategies, and training needs; training; and process improvements.

In essence, the concept of empowerment is based upon the well accepted belief that employees doing their job within the empowered environment are best equipped to understand what needs to be done to improve that job. This process seeks fundamental changes - culturally, organisationally, and technically. This fundamental shift requires many changes in the way the business is organised and practised. Careful analysis of the above empowerment models suggests several elements to be considered in the implementation of empowerment (which are also found by other experts as critical in the implementation of empowerment); they are as follows:

- A new leadership style that enables success of subordinates (Stahl and Anderson, 1994; Pelphrey, 1994).
- Creation of fundamental infrastructures such as suitable organisational structures, equipment/facilities, and fund, etc. (Pryor and Oakley, 1991; Willis, 1994).
- Involvement of all employees including both management and operatives (Maloney, 1995; Ogle, 1992).
- Recognition of employees to achieve esteem and self-actualisation in employees (Proescher, 1994; Milas, 1995).
- Development of a system that helps create and reinforce the concept of empowerment in the business organisation (Shay et al, 1991; Smack et al, 1993).
- Identification of process owners for all conversion and flow processes (Rummler and Brache, 1990; Stewart, 1992).
- Employee education and training on relevant skills (Hessney, 1994; Steiger, 1994).
- Measured process/performance improvements (Petroff, 1994; Congram and John, 1993).
- Self-managed teamwork (Maloney, 1995; Handley, 1994).

To sum up, the empowerment process can be said to consist of nine critical elements:

- leadership styles
- empowerment system
- resources development
- involvement
- education and training
- process improvement
- teamwork
- measurement
- recognition.

To conclude, the concept of empowerment is too complex to stick with (only) one of the constructs of power and control, i.e. participation and delegation (see section 3.3), instead it encapsulate a number of strategies beyond those of participation and delegation (elements as identified above). As a motivational construct, empowerment refers to the power vested in employees that makes them feel personal self-efficacy. In achieving this, the models of empowerment discussed above suggest that both participative and delegative approaches are inevitable for the effective implementation of empowerment, because the empowerment process takes various forms of participation (individual, dyadic, and group) and delegation approaches at several stages of implementation process.

3.5 Propositions of the research

Based upon the various models of empowerment discussed above, and subsequent identification of elements of empowerment, this research initially proposes nine propositions as below. Propositions guide the researcher to narrow down the research investigation specific to the inquiry which the research intends to seek. By stating propositions, important theoritical issues can be made explicit and suggestions formulated as to what relevant evidence must be collected. Each proposition should pay direct attention to something that needs to be examined within the scope of the study (Simister, 1994). The more a study contains specific propositions, the more it will stay within feasible limits (Yin, 1994). According to Simister, Cherns and Bryant (1984) if a proposition is refuted during the course of the research it may be changed to more accurately reflect the emerging data.

Based on the above argument, the following nine proposals were set at the early stage of this research. These proposals are based around the nine major empowerment elements identified in Section 3.4.

- **Proposition 1 (Leadership): Managers and supervisors act as leaders. Leadership exists at all levels of the organisation, including within every empowered employee.**
- **Proposition 2 (Empowerment system): A system, inherently possessing appropriate policy, procedures and plans, facilitates effective implementation of empowerment throughout the organisation.**
- **Proposition 3 (Resources development): Resources (such as fund, equipment, working conditions etc.) are provided to, or are accessible by, employees to support the empowerment process.**
- **Proposition 4 (Involvement): All individuals (and teams) are involved in the process of empowerment with common objectives.**
- **Proposition 5 (Education and training): Employees at all levels of the organisation are continuously trained in terms of technical, group dynamics, problem solving, and decision making skills to manage their own processes.**
- **Proposition 6 (Process improvement): Employees control their own processes. Individuals focus on continuously improving their business related processes.**
- **Proposition 7 (Teamwork): Teams of different kinds (e.g. delegated teams, cross-functional teams, self-managed teams) are established at various levels of an organisation.**
- **Proposition 8 (Measurement): Everyone involved in empowerment measures and records the effects of empowerment, including successes and failures, to monitor progress and strive for further improvement.**
- **Proposition 9 (Recognition): Recognition of achievements (of individuals, teams and departments) motivates them to perform at highest standards.**

3.6 Summary

This chapter recognises empowerment as a process of enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and

informal techniques of providing efficacy information. In eliminating powerlessness, both *participation* and *delegation* styles of decision making processes are found inevitable in practice. The contextual factors that lead to lowering of self-efficacy belief (as discussed in section 3.4) indicate that: a bureaucratic structure and authoritarian management style encourage powerlessness by fostering dependency, negative forms of manipulation, less meaningful organisational goals, poor communications; whilst inaccessibility to resources, poor job design, and poor recognition systems contribute to employee powerlessness. In avoiding these contextual factors and attempting to enhance the organisational environment that persuades self-efficacy, this chapter, finally, identified nine critical elements to be efficiently addressed in the empowerment implementation process. Consequently, based upon these nine elements, nine propositions are made for this research. The nine critical elements are:

- leadership styles
- empowerment system
- resources development
- involvement
- education and training
- process improvement
- teamwork
- measurement
- recognition.

Chapter Four

Research Design

4.1 Introduction

Research design should guide an investigator in the process of collecting, analysing, and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning for example relationships among the variables under investigation. It is a blue print of a given research, dealing with at least four problems, these being: i) what questions to study; ii) what data are relevant; iii) what data to collect; iv) and how to analyse the results (Borum,1991; Philleber, Schwab and Samsloss, 1980). This chapter: discusses these four problems (within the context of this research); highlights the inquiry of and related data required for this study; and briefly discusses the research strategy that was developed as being appropriate.

4.2 Selection of appropriate research strategy

Selection of an appropriate research strategy depends on three main conditions: 1. the type of research questions posed; 2. the extent of control the investigator has over actual behavioural events; and 3. the degree of focus on contemporary as opposed to historical events (Yin, 1994). Using these conditions as the principal indicators for choosing an appropriate strategy, the following examines various options in the light of the research problem and identifies the most appropriate one for this research.

To start with, it is important to understand the primary questions that a research aims to investigate. That is, analysis of the main objectives enables one to identify the basic

questions that need to be addressed. One of the main objectives of this research was to develop an implementation model so as to assist effective implementation of the empowerment concept within construction organisations.

The above objectives pose four questions: what; how; why, and who. For example, what is empowerment? what are all the key attributes of the concept of empowerment? why it is important? how is it being practised in the real world? what are the changes required? why are such changes necessary? and who are the key people involved in different stages of those changes? all need to be answered in this research.

According to Yin, *what* questions may either be exploratory (in which any of the research strategies; experiment, survey, archival analysis, history and case study could be used) or about prevalence (in which surveys or the analysis of archival records would be favoured). *How* and *why* questions are likely to favour the use of case studies, experiments, or histories. If this rule of thumb is applied to the above research questions, it is confirmed that they require survey, archival analysis and case study to collect the required information. For instance, the principal question of this research-*how* can empowerment be implemented in construction organisations?- can only be answered through direct interviews coupled with history and archives search (of companies who have excelled on empowerment). It cannot be satisfactorily answered through survey or archives alone. However, initial information required for case studies such as what are the 'constructs' (discussed later) is required, because, without those constructs, case study investigations would not focus on the subject, rather, they would explore unnecessary areas. The so called 'constructs' can be identified through several means; in this research literature and surveys were adopted. In essence, the research questions led to adopt the research strategy of literature review, followed by survey then case studies.

The other two conditions that determine the research strategy are: extent of control over behavioural events; and degree of focus on contemporary as opposed to historical events. The questions of this research (refer above) are to explore the actual events occurring or being practised at the work place (e.g. how empowerment is being practised). This means that the investigator does not have any control over the events happening at the organisation, but rather, should simply observe and/or request information on what is (or was) going on. In such circumstances, case study would be appropriate, because unlike experiments, the investigator cannot manipulate behaviour as he/she likes. To some extent, information from histories and contemporary events (other methods of investigation) can also be applied to this situation. This is because: histories are the preferred strategy for 'after the fact' investigation, that is, information regarding a 'dead' past (e.g. how was empowerment introduced?); and contemporary events can be directly accessed by the investigator (e.g. how is empowerment being currently practised?). In these situations case study is the preferred route, because, it can be used to deal with a full variety of evidence such as documents, artefacts, interviews, and observations.

4.3 Methodology

With reference to the three conditions of selection of research strategy discussed above, this research favoured a case study approach as the principal source of information, supplemented by survey and literature reviews to confirm the constructs required for case study investigation. Thus, the research has undergone four distinct phases:

- theory development
- questionnaire survey
- case studies
- validation

The aims and outcomes of each of these phases and relevant methodological issues on the data collection techniques are discussed below.

4.3.1 Investigation one: Theory development

Much literature relating to innovative concepts such as Total Quality Management, Reengineering, Change management (within the context of empowerment) and their applications to manufacturing and construction environments were reviewed. The objective of such review was to develop the theory, upon which the case study investigation was to be established. This theory development also signified the units of analysis (see subsequent sections) and propositions (see chapter 3 and chapter 5) for the case studies. Units of analysis or initial propositions relating to the research questions are very important to narrow down the process of investigating relevant information for the questions (Yin, 1994; Simister, 1994). Without such propositions, an investigator might be tempted to collect everything: which it is near impossible to do.

4.3.2 Investigation Two: Questionnaire survey

Theory developed in the literature review phase was confirmed through the questionnaire survey. Since the primary focus of this research was how can empowerment be effectively practised in a construction organisation, the main focus of the literature review was to identify the major elements of (see chapter 3), and key activities (see chapter 5) involved, in the implementation process of empowerment. Initially, it was felt that this might be achieved (by way of interviews) within manufacturing organisations, (because one of the primary interests of this research was to incorporate the innovations currently being initiated within the manufacturing sector). However, further review of the literature revealed that many of these manufacturing organisations had already gone through the

process of successfully implementing empowerment, and the result of this along with appropriate implementation methodologies can be found in a wealth of literature (refer chapter 5). Using this source, the key activities that are critical for the implementation of empowerment were identified. Since these activities were mainly inherent within the manufacturing sector, it was necessary to assess whether the identified activities were feasible to the construction industry. This question was answered through an industry wide questionnaire survey followed by data analysis. The survey process at this stage was rationale, because the information required related solely to 'what' type of questions. For example, what are the empowerment activities?, what is the definition for each activity?, What is the organisational involvement in performing those activities? and so on. Also, the survey was anticipated to collect further (empowerment) activities which were not uncovered in the literature review phase. The sample for this survey was drawn both from construction and manufacturing, so that the data collected could be compared both with the findings of literature and amongst different sub-samples (e.g. manufacturing sector vis-à-vis construction sector) (see chapter 6).

4.3.3 Investigation Three: Case studies

Case study design raises deals with questions such as: what questions need to be studied?; what data are relevant; what data should be collected?; and how do we analyse the results?. Five components of a case study design include: study's questions; propositions (if any); unit(s) of analysis; the logic linking the data to the proposition; and the criteria for interpreting the findings (Yin, 1994). The first two components, i.e., study's question (as discussed earlier in this section) and its initial propositions (see Chapter 4 and Chapter 5), have been already determined through the literature review, and the propositions were further confirmed through the questionnaire survey conducted within both the manufacturing and construction sectors. The following describes the third, fourth, and

fifth components viz., the units of analysis, the strategy of data analysis, and interpretation of the findings.

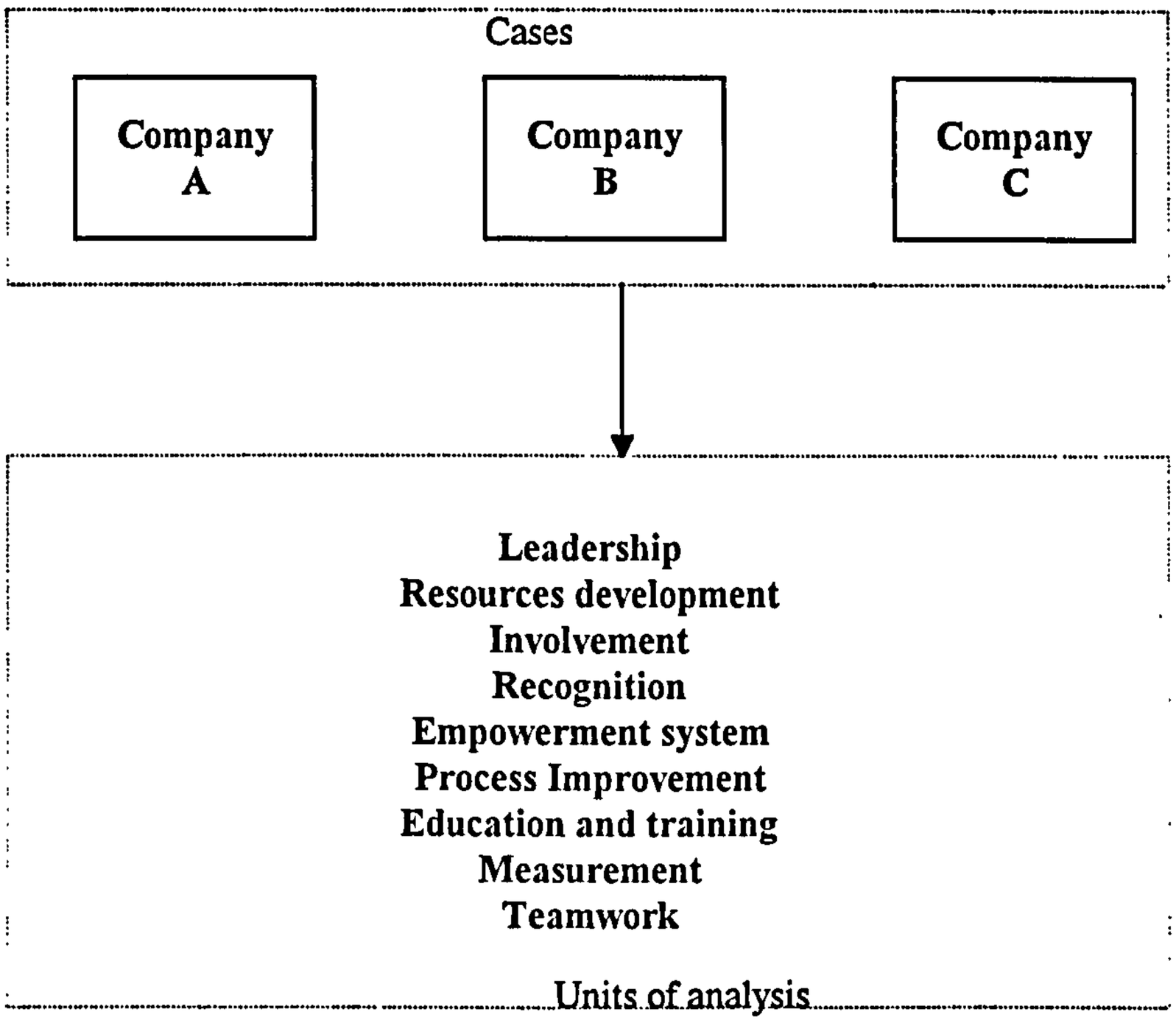
4.3.3.1 Defining the case and units of analysis

The 'unit of analysis' is related to the fundamental problem of defining what the 'case' is. McClintock et al (1979) stated that units of analysis might differ on dimensions of scope of activities, duration, number of participants, and so on. However, they would be tied together by the fact that they have identifiable boundaries, they are within the same case, and that a common set of questions or codes can be applied to them. This demonstrates that a case can be a composition of several units of analysis. For example, a research by Simister (1994), investigated the influences on construction professionals' (Architect, Environmental Engineers, Quantity Surveyors, and Structural Engineers) working practices. The case was a single building project, and the units of analysis being the individuals (professionals) one from each hierarchical level (strategic, general, operation, and direct work) of the professional firms engaged on the project. On the other hand, an individual can also be described as both the case and the primary unit of analysis. Case studies that aim to identify the particular aspects of exemplary students or leaders, are typical examples for this situation. Information about each relevant individual would be collected, and several such individuals or cases might be included in a multiple-case study. However, the establishment of the unit of analysis is related to the background that the initial research questions have defined. In Simister's work, the units of analysis were individual professionals, because, the initial question was to inquire the influences on professionals' working practices. The influences, in this case, can only be identified, if the individuals are set as units of analysis and observed on their day-to-day working practices. However, the main inquiry of this research is to identify the most expedient way that the concept of empowerment can be practised within construction organisations. In this case,

the enquiry should be in terms of how, why, where, and by whom the particular component or activity of empowerment is being performed. Thus, determining the units of analysis was resolved by deciding the critical elements of the implementation process as identified from both the literature review and questionnaire survey. These are: leadership; resources development; involvement; recognition; empowerment system; process improvement; education and training; measurement; and teamwork. This approach was supported by McClintock et al (1979), who stated that the units of analysis need not necessarily be individuals, groups or departments, but can also be a process, an activity, or an organisational behaviour etc.

The problem of deciding whether the research adopted a single or multiple case study approach was resolved by studying multiple cases. The reason being, that a single organisation cannot be expected to have implemented all issues related to empowerment. Case studies listed in Table 5.1 (Chapter 5) have proved that the implementation of empowerment is an evolutionary process. For instance, Self Directed Work Teams (SDWT) have been established through five stages of development (start-up, state of confusion, leader-centred teams, tightly formed teams, and SDWT), and that the complete development process, normally, took two to five years to reach the stage of SDWT. Therefore, if data is collected from more than one organisation, then the possibility of missing information regarding any of the elements of empowerment would be reduced, and data saturation would be achieved. Thus, depending upon the accessibility and suitability of cases, three cases were studied, each being subjected to the same units of analysis. The rational for the choice of the three companies for case studies can be seen in Chapter Six (Section 6.5.6). The criteria for the identification of case companies are discussed in the following section. The relationship between the units of analysis and the cases is illustrated in Figure 4.1.

Figure 4.1: The units of analysis and cases



4.3.3.2 Identifying cases

Two criteria were considered as critical for the selection of case organisations. First, the organisations should be implementing most of the empowerment activities, because, it would enable to capture the full spectrum of the empowerment implementation process, without missing any key areas. Secondly, the organisation should have at least three years in the process of implementation. The limitation of three years was determined since the implementation duration of most of the manufacturing companies has spanned between two to five years. Both these criteria were measured from the questionnaire survey.

Based upon the above two criteria, three questions were set in the questionnaire in order to both identify and screen the responding companies for their proficiency in empowerment. These questions were: the number of years the company has been practising the policy of empowerment; the company's extent of usage of the sixty two

identified empowerment activities; and the company's willingness to participate in future aspects of this research. Analysis of the responses to these questions indicated that only four companies were suitable for case studies. One among the four, had withdrawn its willingness to participate at later (refer Section 6.5, Chapter Six for detailed evaluation). As a result, only three companies were accessible for this study. It can be seen from the above that the researcher had no control over which firms would participate in the research.

4.3.3.3 Sources of data collection

Two sources of information were used: interview with individuals, and study of relevant company documents. Interview was the primary source of information to obtain data regarding both the implementation process of empowerment and their effects on business performance. As a secondary source, company's documents (such as quality manual, procedures, roles, and policies) were used to supplement the data obtained from interviews.

According to Bouchard (1976), the format of questions asked in interviews can be classified in four ways: totally structured; structured questions with open responses; open questions with structured answers; and totally unstructured. Depending upon the type of inquiry, a researcher can be very flexible in using some or all of these formats for collecting necessary information. For the purpose of this research, 'structured questions with open responses' was used. This format was appropriate because the required inquiries did not need to identify first general topics related to empowerment implementation and then the specific topics. The general topics (the critical elements of empowerment implementation) and related issues (empowerment activities) were already established and determined, prior to the interview, through both the literature review and

earlier questionnaire survey. The only information required from the interview were answers to specific questions, that is, related to specific activities. For example, how and by whom were the activities being performed in practice? and what were their beneficial effects?. To accomplish this task successfully, structured questions (with open responses) format is methodologically valid for this research (see Appendix C for interview questions). Also, this approach would ease the process of cross-case analysis.

Another important feature to be considered before the actual data collection is the identification of interviewees for each case. In this instance, the individuals of companies who responded to the postal questionnaire survey were considered appropriate for interviews. Two reasons for this decision were; first, they were the appropriate key persons (such as Quality Directors, Quality Managers, Human Resource Managers etc.) assigned by their companies to participate in the survey (for being well acquainted with their company's implementation process). Second, by responding to the questionnaire survey, they had already become aware of the framework of this research. A similar type of research (Mann, 1992) which investigated business companies on the implementation of TQM, also successfully used the same strategy (an interview with a single key person from each company was undertaken to uncover the implementation approach of TQM). Thus, primarily, interviews with one key individual from each organisation were arranged to collect all of the necessary data for the research inquiry. However, if data saturation is not met with by single interview, then further interviews with identified staff of the same organisation was planned.

4.3.3.4 Case study data analysis

To obtain factual results from the case study, care needs to be taken in terms of treating the evidence fairly, delivering unbiased results, and ruling out misinterpretations. Success

of case study data analysis depends on the researcher's notion on the use of different techniques of analysis prior to the data collection phase. Without this knowledge, the study may result in investigations becoming stalled at the analytic stage. These seek a simultaneous thinking on both data collection and data analysis. Prior to discussion of the specific techniques to be followed, an understanding of the dominant modes of analysis would be of some help to identify the mode of analysis appropriate for this study.

The four important modes of analysis appropriate for case study research include: pattern-matching, explanation-building, time-series analysis, and program logic models (Yin, 1994). Pattern-matching logic compares an empirically based pattern with a predicted one (or with several alternative predictions). Explanation-building is a process of refining a set of ideas, in which an important aspect is again to entertain other plausible or rival explanations until the final explanation is accomplished. The final explanation may not have been fully predicted at the beginning of the study, but instead, the explanation is built after a series of iterations. Time series analysis can be used to examine some relevant 'how' and 'why' questions about the relationship of events over time. The program logic model is a combination of pattern-matching and time-series analysis. The analysis stipulates a complex chain of events (pattern), and determines whether a pattern match has been made with these events, over time.

Selection of the appropriate strategy mainly depends on the primary result the research intends to produce from the analysis, and the type of data. Prior to the case study, this research established nine propositions (see Chapter 3), and subsequently, those propositions were confirmed and an activity model was developed during the questionnaire survey. Eventually, from the case study data, the research aimed to: further confirm the initial propositions and validate the activity model to ensure the reliability of the initial findings; show similar patterns in the implementation process among cases; and

similar effects (causal-benefits) across cases. Within the context of these three aims, the last two of the above four strategies (i.e. time-series analysis, and program logic models) become inappropriate for this research, because, they are closely related to data collected over time. The second strategy - explanation building - is an iterative process of building a theory or confirming propositions by repeated observation of a case, which is not applicable to this research neither. However, the above three aims emphasise 'replication' (one of the methods of pattern matching) across the cases, in order to obtain a valid result from them all combined. The replication approach to multiple-case studies as illustrated by Yin (1994) is that if one has access only to three cases of a rare clinical syndrome in psychology or medical science, the appropriate design is one in which the same results are predicted for each of the three cases, thereby producing evidence that the three cases did indeed involve the same syndrome. Similarly, for the purpose of this research, the implementation process of empowerment and its effects on a contractor organisation can be investigated for replication of similar results across several cases. This replication logic in multiple case studies has been advocated by many experts (Herson and Barlow, 1976; Campbell, 1975; Creswell, 1994).

The specific techniques of case study analysis are heavily dependent on an investigator's own style of rigorous thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretations. In addition, they depend on the nature of data and type of questions the case study intends to answer. For the purpose of this research, the specific techniques to be used mainly include Data Flow Diagrams (DFD) and various analytic techniques (which are detailed in Chapter 7). DFD show the passage of data through a system. They focus on the processes that transform incoming data flows (inputs) into outgoing data flows (output) (Skidmore, 1994). DFDs can be generated through one of the formal methodologies of CASE (Computer Aided Systems Engineering) tools such as SSADM (Structured Systems Analysis and Design

Methodology). Such analysis will result in the development of a model for the implementation of empowerment (The choice of the analysis technique is discussed in detail in Chapter Seven). Other analytic techniques, as suggested by Miles and Huberman (1984) were also used to asses both the performance effects of the implementation process and the cross case analysis for replication. These techniques include:

- Putting information into different arrays;
- Making a matrix of categories and placing the evidence within such categories;
- Creating data display-flowcharts and other devices for examining the data;
- Tabulating the frequency of different events;
- Examing the complexity of such tabulations and their relationships by calculating second-order members such as means and variances; and
- Putting information in chronological order or using some other temporal scheme.

Validation of the findings of this research has to be centred on the problem of assessing whether one study's findings are generalisable to alternate case studies amongst multiple cases. Thus, the logic of replication, as already discussed above, is methodologically appropriate for this study. Generalisation, in this instance would be testing a theory through replication of the research findings, in a second or even a third neighbourhood (cases), where the theory has specified that the same results should occur. Once such replication has been made, the results might be accepted for a much larger number of similar neighbourhoods (construction companies), even though further replications have not been performed (Yin, 1994).

4.3.3.5 Scheduling of data collection

As described in Section 4.3.3.3, this research intended to interview one individual from each of the three case companies. When interviewing key persons, the interviewees'

schedule and availability has to be considered; not mereley the researcher's convenience. Interviewees, as identified from the questionnaire survey, were requested by way of letter to notify their availability for interview within a specified duration. This letter was accompanied by the results of the questionnaire analysis, as promised, in order for the interviewee to be informed of the initial findings of the research. Prior to interview, each company was sent a copy of the interview questions accompanied with a letter to remind them of the time and date of interview. Each company was asked to have a photocopy of their vision/mission statements, quality (empowerment) policy, organisational structure and other relevant documents at the interview. In all cases, approximately two hours was spent with the respondent and other relevant staff in collecting necessary documents required for the research. Interview time was set at approximately three hours. Information was recorded by both note taking and tape recording. This has enabled the researcher to refer to the data in same detail, so that everything that was discussed could be fully understood.

4.3.3.6 Design of interview questions

Inquiries such as "how does your organisation function within the concept of empowerment? and why?" were collected from the interviews. However, more specific details such as personnel policies, and organisational structure were collected from archives. In designing the interview questionnaire, it was considered that the information needed by the respondent should be easily 'at hand'. Samples of structured interview questions, developed by other researchers and drawn from case study books, were taken into account in striving for better presentation. The structured interview consisted of three sections: 1) organisation, 2) empowerment implementation (nine units of analysis), and 3) effects of empowerment on business performance.

Organisation

Questions regarding company details included the organisational characteristics of the company (such as number of employees, type, volume, and size of construction projects the company undertakes, and company turnover. See Appendix C for questions.

Empowerment implementation

This section investigated how empowerment was implemented, including empowerment policy information, and how the organisation works under the implementation of empowerment. The questions were mainly designed around the derived empowerment activity model and nine units of analysis (leadership, resources development, involvement, recognition, empowerment system, process improvement, education and training, measurement, and teamwork) (See Appendix C)

Effects of empowerment on business performance

The business performance measurement criteria, as identified in Chapter 5, were used to identify the effects of empowerment activities. Both structured interviews and documented evidence (if available) were used to: identify whether companies measure the effects of empowerment activities ; and observe their effects on both SBP (Strategic Business Performance) and OBP (Operational Business Performance). Mann's (1992) research on the performance of manufacturing organisations revealed that most companies did not measure the effects of quality activities in terms of SBP. The reason may be that the SBP factors not only rely on the internal operational performance but also on external factors such as the performance of competitors, and economic trends. Also, Mann's investigation identified that companies measured their progress against objectives and not the effectiveness of implementation. Thus, taking these experiences into account, this research used only some of the measurement criteria (see Appendix C), from those identified in Chapter 5. Detailed assessment of performance of all the case companies are

beyond the scope of this research, because the primary aim was to develop an effective implementation strategy for empowerment. Thus, investigation on performance was restricted to simply asking interviewees as to their company's performance over some of the performance criteria mentioned in the questionnaire (see Appendix C).

4.3.4 Investigation Four: Validation

This research validated the findings in three dimensions: internal validation; external validation (including feasibility study). Usually, in qualitative research (e.g. development of a systems model), the validation stage is conscious, coherent and defensible. The findings cannot be validated for exact replication (like to like) as is the case in experimental research (Checkland 1981, Erlandson et al 1993). The reason is being that systems of different organisations cannot be exactly replicated, because each individual organisations will have their own features. This is the reason that this research has used the replication strategy for corroboration, that is a logical consistency in the implementation approaches amongst companies. Taking this into account, the research has used the above two approaches. Regarding internal validation, as suggested by Creswell (1994), the steps to be undertaken include: finding triangulation of or convergence among different sources of information; and explaining the appropriateness of how informants (respondents) and the researcher were involved in all phases of the research (i.e. through survey and interviews). External validity deals with the reliability issue. To test reliability, Creswell argued that in multiple cases, one can examine whether the same patterns or events or thematic constructs are replicated in different settings. This replication logic in the case study analysis (adopted for this research) has been explained in detail in section 4.3.3.4. Finally, experts (or users) comments on the proposed findings (model) were used to assess the feasibility of the findings. This approach has been greatly emphasised in systems development methodologies elsewhere (Checkland, 1981; Davies

and Ledington, 1991). Full details of the expert-feedback techniques applied in this research can be seen in Chapter Nine.

4.4 Summary

This research has undergone four main phases of investigation: theory development; questionnaire survey; case studies; and experts' feedback. Literature review on theories and practices of empowerment, within the context of manufacturing and construction environments, led to the development of initial propositions (nine elements and sixty-two activities of empowerment). To evaluate the propositions in terms of their feasibility to the construction sector, an industry wide questionnaire survey was conducted. Based on the propositions established, and subsequent confirmation through the survey, detailed investigation on three identified construction organisations who have implemented empowerment were studied, which led to the development of a generic model for the implementation of empowerment in construction organisations. The sources of data collection, scheduling of data collection, questionnaire design, analysis techniques (including validation), and methodological implications (including rationale) on choosing the right techniques have been considered in detail.

Chapter Five

Current Practice of Empowerment and Empowerment Activities Identified

5.1 Introduction

In Chapter Three, nine research propositions were set. These propositions were built upon nine major elements of empowerment: 1) leadership; 2) empowerment system; 3) resources development; 4) involvement; 5) education and training; 6) process improvement; 7) teamwork; 8) measurement; and 9) recognition. This chapter further explores the nine propositions in two dimensions viz: theoretical implications on their implementation; and their current practise in the industry (both construction and manufacturing). Consequently, the following sections discuss each of the nine elements separately and identify respective activities that result in improved performance in effectively implementing empowerment. At this point it is important to recognise that 'activities' are functions of 'elements' and that their definitions will apply throughout this thesis henceforth. The activities identified from this chapter provided the basis (or constructs) for subsequent case study investigations.

5.2 Leadership

Leadership deals with the management of human behaviour. Leadership is the behaviour of an individual in directing through communication and interpersonal influence, the activities of a group toward a shared goal: "getting others to want to do something that you are convinced should be done" (Kouzes and Posner, 1987). Within this context, the role of leadership can be described as anticipating changes in the business environment and

proactively create new environments within an organisation that have an ability to achieve the aims of the changes, through an involved workforce. Gillen and Kelly-Gillen (1994) identified four types of new leadership styles in alignment with four kinds of human beings (senior management) as articulated by Peter Drucker. The four leadership tasks of senior management, as stated by Drucker, are: the people man; the thought man; the action man; and the front man (Drucker, 1973). Gillen and Kelly-Gillen relate these four tasks into the following four *new* styles:

- *Type one leader*: the people person who leads through empowerment, and seeks alignment between personal and organisational values and communicates the value of common purpose.
- *Type two leader*: the thought person who leads through conceptualising, and seeks alignment between people and procedure and define what is to be done to achieve the vision.
- *Type three leader*: the action person who leads through coaching, and seeks alignment between goals and output and act to achieve the output.
- *Type four leader*: the front person who leads through envisioning, and seeks alignment between 'what is' and 'what might be' and challenge the new possibilities for future.

If these four styles are compared with the empowerment model of Conger and Kanungo (1988) discussed in Chapter 3, it can seen that all of them are required for empowerment implementation. Leaders should possess all of these four characteristics in: empowering people to rise the value of both people and organisation; establishing appropriate procedures and desired skills of people in alignment with an established vision; measuring the current status with the promised output; and deciding future actions based on current problems.

The term 'leadership' does not only apply to senior management, but it should also exist at all levels of an organisation. This means that leadership at all levels including within various teams (e.g. functional, technical and delegated teams). If given a challenge of improved opportunity some operatives will accept a leadership role in commencing change (Weed, 1992.). According to Weed, boiler operatives of the Eastman Kodak Company (USA) were empowerd to take a lead of their small teams in optimising auxiliary equipment power usage on boilers. Consequently, the teams led by operatives achieved greater improvement in many of their related processes which resulted in lower cost services to their customers. This situation requires conventional managerial practice to be changed into one of leadership practice, including leadership at lower levels of an organisation. Managers and supervisors act as leaders in getting employees to do what needs to be done. According to Zaleznik, managers carry out responsibilities, exercise authority, and worry about how to get things done, whereas leaders are concerned with people's beliefs and gaining their commitment (Guarriello, 1994).

The primary leadership challenges of supervisors/managers is to discard the traditional way of managing workers through fear and intimidation, but to learn to lead individuals or teams through participation and empowerment (Conger and Kanungo, 1988; Stahl and Anderson, 1994). In essence, a competent leader will have the following characteristics (Joy and Joy, 1994; Guarriello, 1994).

- Learn to delegate responsibility.
- Create a work environment that promotes open discussion of problems.
- Have knowledge on their jobs, businesses, and the environment in which they are working.
- Embrace new approaches and avoid defending the 'old' ways.

- Inspire sceptical team members to accept teamwork. In order to preserve the harmony and stability of the team, leaders attend to the well being and concern for those team members, including individual needs and satisfaction.
- To deal with different team members, peers, or superiors in different ways, leaders play different roles in different situations. This includes the role of teacher, coach, or dictator.
- Motivate team members to be their best every day.
- Able to make their intentions in a clear and unambiguous manner.

5.2.1 Role of leaders

Management must provide an environment conducive to empowerment and become cheer leaders, motivators and 'barrier to success' removers so as to support the empowering process (Pelphrey, 1994). This means introducing major changes such as new culture, leadership, functional relationships, and so on, in the organisation. These changes, first, require the leadership of top management in envisioning appropriate strategies that are conducive to successful implementation of change. Steps that are preconditions to successfully bringing about any major change are:

- Creating a vision statement that clearly defines the future direction of the organisation.
- Relaying the vision to all segments of the organisation.
- Defining the goals and objectives clearly, in terms understood by every employee.
- Ascertaining the company's current condition by assessing the core competencies; competition; peoples' strengths and weaknesses; technological trends, and other variables.

- Developing the critical strategies - including specific milestones - that lead from current condition to the condition described in the vision statement (Mojonnier, 1994; Pelphrey, 1994).

The vision statement has several purposes. According to Mojonnier, it: directs the combined efforts of the organisation into taking actions that are required to make the organisation effective; serves as a motivational tool; and provides employees with direction to take actions that are consistent with the organisation's vision and mission. The vision should be realistic and attainable, and should address: customers and markets; technology and its characteristics; performance review systems; compensation systems; organisational structure; competition; personnel policies; financial position; macro and micro economic variables; information; business function; and culture (Majonnier, 1994; Proescher, 1994). These are the strategic level roles of leadership that should be inspired and focused throughout the organisation or enterprise, as an integrated approach when transiting from the current system to a desired one (empowerment), otherwise organisation wide implementation could not be achieved. Analysis of reported case studies (presented in Table 5.1) emphasised that organisation-wide implementation of empowerment results in improved performance. The three elements that are advocated by Proescher (1994) for leaders to deal with, when an organisation-wide integrated approach is adopted, include: *structure; function; and culture*. Leaders should deal with each of these elements and balance the three throughout the organisation.

'Structure' refers to the structure of an organisation or enterprise, or the structure of (for example) the plant layout at shop floor. Organisational structure refers to how boundaries are defined and interfaces reengineered in order to facilitate the flow of information through the management process. Leadership defines these boundaries so that each employee or department fits into the whole picture of the changed environment.

Organisation 'function' refers to the group of activities that contribute to achieve a unified goal. In construction organisations, design, quantity surveying, bidding, constructing etc., are some examples of functions. This includes other functions relating to quality, employee development, information systems, etc. Leadership should identify and define both functions and their interrelationships.

Table 5.1. Companies implementing empowerment

No.	Company name
1	Geauga Company (USA), (Ogle, 1992)
2	A.O. Smith Corportaion (USA), (Shay et al, 1991)
3	Westinghouse Electronic Systems group (USA), (Nashold et al, 1993)
4	IBM Enterprise Systems (USA), (Smak et al, 1993)
5	Loral Aeronutronic (USA), (Tiernan, 1993)
6	E-Systems, Inc. (USA), (Pryor et al, 1991)
7	Zenger-Miller, Inc. (USA), (Musselwhite and Moran, 1991)
8	Eastman Kodak Company (USA), (Weed, 1992)
9	Hypro Corporation (USA), (Sneen, 1991)
10	Hughes Aircraft company, (Avrick et al, 1992)

Webster defines 'culture' as the integrated pattern of human behaviour that includes thought, speech, action, and artefacts and depends upon human's capacity for learning and transmitting knowledge to succeeding generations (Proescher, 1994). Leaders should observe, confront and utilise patterns of human behaviour, in alignment with the vision of the organisation, to achieve a unified goal.

Having clearly defind the above three elements, the next step is to lead the transition towards the desired new system implemented throughout the organisation. Normally, people are resistant to transit towards a new culture and system, especially, if it requires a radical change in the way they have been working for a long time. This requires

committed leadership activities that make an involved and informed workforce. The critical success factors of leadership during transition include the following:

- Expressing a sincere desire to change.
- Defining specific measurable goals and objectives.
- Developing a time-phased action plan.
- Continually expressing confidence in the ability of the organisation to change and do it quickly.
- Demonstrating absolute determination which displays to the organisation that change is imminent.
- Top management functioning as the daily example reinforcing that the change has been breathed into their practice and consequently will be fulfilled throughout the organisation (Pelphrey, 1994).

The leadership roles so far discussed focus on senior management. However, the characteristics as discussed above apply to leaders at all levels of an organisation. One of the main themes of empowerment is empowering employees (individuals or teams) to take their own business level decisions. This requires that employees are able to visualise the future needs that satisfy customers and make logical decisions on their own business operations. This applies to every individual. The process of introducing leadership at the lower level of an organisation is a challenging problem. Maloney (1995) proposed the following solutions for this problem: the team may have a permanent leader such as a foreman; a rotating leader among members; no designated leader; or it may adopt the star system of shared responsibility in which individual team members assume responsibility for various aspects of the leader's job. Responsibilities can be taken on for areas such as production, administration, interpersonal training, safety, organisational relationships, team meetings and performance improvement. For instance, at Zenger-Miller, Inc. (USA),

leadership duties are shared among all the team members, who conduct team meetings and co-ordinate with a variety of groups outside the team. This leadership function is often rotated among team members as they choose their own leadership solutions. Such a leadership role is fluid and a shared one. On the other hand, the role of the supervisor/manager in dealing with the empowered teams, at shop floor include: participate in weekly master schedule meetings; provide daily performance feedback to the teams; help the team solve problems; manage manpower budgets; challenge the team to improve; and assist them to measure performance (Joy and Joy, 1994).

5.2.2 Leadership activities

The above discussion has identified the following key leadership activities for implementing empowerment.

- *Vision/mission:*A statement which visualizes the desired future state of the overall business. All procedures goals and standards of the business are established to achieve the vision. Vision statements are usually cascaded down to missions which detail shorter-term site aims or departmental aims.
- *Management commitment:*Involvement of management in establishing new goals and directions for the company and then leading the entire workforce towards the achievement of those goals. These include: a 'sense of belonging' created by an informed and involved workforce; development of pride, trust and responsibility for results; and the production of confidence in management leadership.
- *Role model:* Leaders at all levels of management structure play exemplary roles in the implementation of process of change, wherein the other members of a team/department or organisation are encouraged to observe and follow the attitudes and behaviour of these leaders.

- *Champions of empowerment:* Individuals who are comprehensively trained in the application of quality and empowerment activities by participating in teams and the general work process. They are expected to transfer the empowerment ideology, knowledge and skills to others.
- *Executive walkthroughs:* Top management staff often walkthrough the plant/department or site and talk with employees. This ensures commitment of the management. Also, employees receive immediate feedback regarding their performance.
- *Encouragement:* Employees should be encouraged to adopt the changed culture required for implementation of empowerment and take responsibility to improve the processes they own.
- *Facilitation:* Enabling employees to take part in the empowerment process and equipping them with the necessary skills and techniques to make improvements in their own activities.

5.3 Empowerment system

Three kinds of changes that should be envisaged when designing a system include:

- Structural: organisational groupings, reporting structures or functional responsibilities.
- Procedures: processes of reporting and informing.
- Attitudes: changes in influence, expectations and perceptions (Skidmore, 1994).

It will be seen (from the subsequent sections) that all of the above changes are necessary in deploying the concept of empowerment. It is evident that empowerment seeks fundamental, radical changes in the way in which organisation, functions, and reporting procedures are structured, and it also demands people to adopt new behaviours and

attitudes that are conducive to empowerment. Leadership, Resources development, Involvement, Recognition, Process improvement, Education and Training, Measurement, and Teamwork, all represent elements in an empowerment system. Presence of these elements and their related issues are important to optimise the system, because, absence of any of these issues will have destructive impact on the objective of implementation.

As can be seen in many examples (Shay et al, 1991; Ogle, 1992), the traditional quality system was inspector-dependent, where a large number of job classifications were rigidly controlled by elaborate contractual language. Operators were accustomed to working at the same job for long periods, and their activities were closely controlled by a cadre of supervisors. Conversely, empowerment stresses operator-based quality control, lowered levels of decision making, flexibility, teamwork, and mutual adjustment between operations and functions. This concept requires that producers, supervisors, and inspectors become increasingly flexible (Shay et al, 1991). Flexibility requires operators to be multi-skilled, and to develop an ability to perform all of the operations of their team. The empowerment system should recognise these issues. Within the system, processes and jobs should be identified for each individual and teams and respective roles established.

5.3.1 Role interaction

Empowerment emphasises cross functional teams, self managing teams, and self managing individuals. These require role interaction amongst all members of the teams and between teams themselves for the system to be efficient. Interactions between managers/supervisors and subordinates require an appropriate leaders-followers concept to achieve the full potential benefit of empowerment. Barnett (1994) identified three roles each, for super ordinate and subordinate employees. The roles of super ordinate

employees are: authoritarian, permissive, and equalitarian. The authoritarian has a strong character who confronts people and often creates conflicts. The permissive manager is concerned with pleasing people and fails to make important decisions. These leaders are subjective and direct frustration at themselves and the system. However, the equalitarian is rational, objective, and seeks solutions, focusing the achievement of organisational goals by utilising employees as useful parts of the work environment.

The roles of subordinate employees are: rebel, ingratiator, and critic. The rebel is a trouble maker and complainer who has little tolerance for weakness and continually tests the manager for weak points. The ingratiator tends to be self blaming, seeks power and status and has a high value for structure and traditional power. The critic devotes energy to problem-solving and blames no one, but requires enough power to complete the task.

It is apparent that most of the role interactions such as authoritarian-rebel, authoritarian-critic, permissive- ingratiator, equalitarion- rebel, etc. are not compatible for implementing empowerment. Most of these interactions are antagonistic against each other, where the concept of empowerment would be counterproductive and destructive. In the design of role interactions between superior and subordinate, it can be noticed that the best interaction (that activates them to adopt the principles of empowerment) is Equalitarian-Critic. This relationship is primarily objective. The critic-subordinates are not concerned with power for power's sake, but request enough to fulfil their tasks. Similarly, the equalitarian-leaders (managers) are equally unconcerned about power and readily share whatever power is necessary. This interaction develops a feeling of mutual interdependence, hence, a most successful empowerment deployment.

5.3.2 Development of an empowerment system

Analysis of case study literature (Shay et al, 1991; Joy and Joy, 1994; Ogle, 1992; Smack et al, 1993) suggests the following points to be considered when designing an empowerment system:

- The team based empowerment concept has radical implications on operating methods, management and operatives and the management system itself. The consequent affect will be on: all employees from chief executives to operatives; external customers and suppliers; procedures; job classifications; roles of employees; training; and information systems.
- The shop floor scheduling and planning system is owned and operated by the work - teams. It is not driven by the planning managers, but assisted by them.
- All participants including supervisors, inspectors, and operators should be included in establishing an effective empowerment system. Areas that should be addressed include: the information that teams required in order to manage their own production and quality; assessing the tasks require to manage an operation; defining effective roles for employees; controlling and improving an operation; customer-supplier relationships; required training; and developing action plans for implementation.
- The basic responsibility for quality, work control and organisation, trouble shooting, operational improvement and standardisation should be transferred to work teams and team leaders.
- The management assumes responsibility in training, supporting team activities, and obtaining resources for improvement.
- Initial designs are subject to change as a result of experience and changing conditions.

- Mutual adjustment should be built into each operation. This includes internal customers and suppliers, and built-in information flow and feedback between operations.
- Professional advice or assistance in designing the system may be necessary, depending upon the level of expertise available within the organisation.

5.3.3 Empowerment system activities

The above discussion led to identify the following system activities for implementing empowerment.

- *Empowerment system:* A system that describes a set of policies, procedures and activities by which a company can establish, document and maintain an effective and economic empowerment management.
- *Quality policy:* The overall intentions and directions of an organisation regarding quality, as formally established by top management.
- *Procedures:* Documents which define the aim and scope of an activity, which also describe by whom, how, when, and where the activity is to be carried out.
- *Roles of employees:* Documents which describe a pattern of behaviour typical of employees in relation to their processes. This includes a reporting system and relationships with other employees.
- *Empowerment implementation plan:* A plan which describes the methodology of the implementation process of empowerment. This includes by whom, when, and where the activities of implementation are to be performed.

5.4 Resources development

Once the desired goals (vision) are identified, fundamental infrastructures, that are necessary to support the transition toward the company vision, must be assessed and built into the organisation (Pryor and Oakley, 1991; Willis, 1994). For instance, the following matters have been focused at Hughes Aircraft Company (USA) when their Test Organisation has gone through the empowerment process:

- organisational structure;
- procedures/philosophy;
- human resources (quantity, skills, job assignment);
- equipment/facilities; and
- costs (Avrick et al, 1992).

These matters must be considered to make sure that the organisation is sufficiently equipped with necessary resources to implement empowerment. These include: an appropriate organisational structure that foster the empowerment approach; appropriate procedures and methodology for the effective implementation of empowerment; development of employees regarding their skills for handling the required tools and techniques for process improvement; provision of required facilities, including appropriate working conditions, for the workforce; and provision of adequate fund.

5.4.1 Organisation

Empowerment puts an increased emphasis on human values in terms of changed culture, group working, and increased skills. This changing environment includes a blend of the abilities of the team members plus a match of their combined talents against the complex

of skills needed in the cross-functional work place. Unfortunately, traditional functional organisation structures do not address these problems. They fail to master the process of identifying and using a firm's human capability, they stifle initiative, and jeopardise competitiveness (Audette, 1994). Steiger (1994) stated that in a traditional organisation, information flows vertically through many levels of hierarchy, where employees are not willing to share methods, success and failures. Internal competitive pressures force duplication of many efforts. Internal pressures launch defensive and offensive attacks within the organisation, and cause chaos, and loss of direction and leadership at all levels. The process of empowerment is impossible in this type of environment. Steiger (1994) argued that traditional hierarchical organisations are not designed to provide for people's higher order of needs, self-respect and self-actualisation. The result is lack of motivation amongst employees.

Empowerment requires an organisational structure that: involves all levels and functions; facilitates multi-disciplinary teams, including cross-functional teams; supports self directed work teams; and emphasises a continuous training of employees (Shay et al, 1991; Audette, 1994; Steiger, 1994). Specifically, the infrastructure must have teamwork as the cornerstone on which the organisation is built (Dolan, 1993). Also Steiger argued that change has to be a change of group atmosphere rather than of single items. The fundamental aim underlining group working is creating a strong 'we' feeling which increases morale and overall commitment.. This requires an organisation to be intertwined both vertically and horizontally. For example, at A.O. Smith Corporation (USA), the large centralised facility was broken into six smaller units or "plants", each with a customer focus (Shay et al, 1991). Most support services were likewise decentralised, reporting to the plants. Strong mid-level advisory committees, comprising of members from mid-level management and direct work, were developed. These groups were close to the operations, and involved all functions which affected the success of operations

including engineering, maintenance, quality control, transportation, and human resources. As a result, these committees had the required authority and expertise to make significant operational decisions, to manage resources, to support off-line problem solving teams on the shop floor, and to implement projects. Many work teams comprised of members from production, maintenance, service, supervision, etc., and were formed around each advisory committee to identify and analyse problems, and implement solutions for process improvement. The policy committee, comprised of members from senior corporate, technical, and labour levels, to establish policy, identify plant-wide priorities, plan manpower and communicate to the entire organisation.

In essence, having all the above characteristics in place, an organisation can be defined as a Type-III organisation. According to Sheridan (1993), in a Type-I organisation, the management's objectives are to increase sales volume and move on to the next customer as quickly as possible. In a Type-II organisation, resources are expended on activities that are not adding to customer service. Bureaucracy prevails in this type of organisation, and they face a shrinking customer base, have less disposable income, and operating costs continue to rise. Type-III organisations have the following main ingredients:

- Policy deployment: A system that encourages the use of quality indicators to determine the vision and long-term, mid-term, and short-term plans for the organisation.
- Employee empowerment: Employees manage their individual processes
- Teams: Teams are extremely useful in obtaining employee commitment to the company's goals and solving problems.
- Training: Changing corporate culture requires a substantial investment in training.
- Communication: It is important to establish and maintain communication between service providers and users both internally and externally.

- Continuous improvement: Continuous process improvement is necessary to achieve customer satisfaction and increases market share.
- Supplier performance: Performance of suppliers is critical for improving quality of the product produced.

Sheridan suggested adoption of Total Quality Management (TQM) to become a Type-III organisation. TQM offers tools that allow an organisation to set a clear direction for the journey forward. It enables an organisation to effectively address the above ingredients. This would indicate that employee empowerment can be successfully applied within the context of TQM. The Executive Vice President of Zenger-Miller,Inc., (Musselwhite and Moran, 1991), based on his company's experience, suggested that Self Directed Work Teams (SDWTs-one of the empowerment approaches) are a logical 'next step' for an organisation that has achieved systematic alignment with TQM.

The above discussion indicates that organisational restructuring should incorporate Type-III characteristics to implement empowerment. As practised by the FM Corporation (USA), Resource Teams can be established as one option to perform the restructuring activities (Willis, 1994).

5.4.2 Working conditions and funding

Working conditions and provision of enough funds for the implementation efforts and day-to-day business related works are important. A case study on the University of North Carolina in Charlotte reported that under ideal working conditions, productivity could be improved by between 5% and 20% (Buch and Shelnutt, 1995). Development of working conditions conducive to the empowerment process have been focused by many companies [Hughes Aricraft Company (Avrick et al, 1992); A.O Smith Corporation (Shay et al,

1991); Zenger-Miller, Inc. (Musselwhite and Moran, 1991)]. Musselwhite and Moran argued that prompt access to resources, and often the physical redesign of plants and offices should be in place if any organisation considers to adopt empowerment. At A.O.Smith Corporation, plant improvement planning on a divisional basis was performed to set priorities, identify resources and establish a time frame to meet improvement objectives. This process was performed by Advisory Committees represented by both middle level management and labour.

Availability of enough funds for improvement-efforts is critical for successful implementation. According to Caldwell (1994), American companies are expected to spend an estimated $32 billion on reengineering projects. Nearly two-thirds of those efforts are predicted to fail. However, the case studies of companies listed in the Table 2 reported a large profit rate after reengineering their organisations for empowerment. Also, Ravikumar (1994) stated that the predictions of failure do not seem to slow down these corporations from aggressively pursuing reengineering programs. In an empowered environment, finance can be handled in two ways for better utilisation. The first is providing enough funds for implementation processes including training, awareness, and awards. For instance, Geauga Company (USA) invested $600 in each team member, for visiting customers and suppliers organisations to assess how their products fit into the customers requirements and to see where their raw materials came from. The second is providing financial information at the point of need. This is necessary because, in empowerment, business decisions are no longer exclusively made by management; they increasingly become the domain of the entire organisation. Employees need to understand the financial implications of their decisions. Christison (1994) argued that employees need to understand basic accounting concepts, financial statements, and the financial effects of their daily decisions. If such information is not provided to employees, they might not understand the potential cost of their business decisions, and consequently, there is a

possibility of cost overrun of the estimated project/process. Texas Eastman Chemicals Plant (USA), a division of the Kodak company, has developed an innovative balance between employee empowerment and financial control, and consequently, the department profit doubled in four months, whilst quality measures improved by 50% (Christison, 1994).

5.4.3 Resources development activities

This section has identified the following activities as being critical for developing resources in the implementation of empowerment:

- *Organisational restructuring:* Changing the organisational structure into one suitable for implementing the empowerment concept. This includes decentralising the structure and levels of decision making.
- *Working conditions:* A favourable working environment for employees should be provided to make them feel comfortable. This includes a clean working atmosphere, ample canteen and recreation facilities, and working space.
- *Funding:* Ensuring that sufficient funds are available for the implementation of change.

5.5 Involvement

An organisation can only change its culture if most individuals are motivated to be involved in managing and adopting the change. Since there is potential for improving employees organisational performance as well as employee satisfaction, it is important that strategies for securing employee involvement be identified (Maloney, 1994). The involvement of an individual is not restricted to coping with the changed culture but also in the day-to-day management of the work process for continuous improvement. One of

the principles of empowerment - giving the authority to employees to take their process related decisions and requesting them to assume full responsibility - is in itself is a motivator in this respect. However, employees cannot be expected to take process ownership in the absence of sufficient information. For example, at IBM Enterprise Systems (USA) employees did not understand some key principles of empowerment (support versus management, individual ownership, and accountability etc.). These principles had to be explained and reinforced through a new learning approach which encompassed everyone who was part of it (Smack et al, 1993).

There are several factors governing the extent of employee involvement including: organisational structure, policies and procedures, performance appraisal, a reward system, operations conducive to work teams, and leadership styles (McGrath, 1994; Musselwhite and Moran, 1991). Maloney (1994) proposed five approaches to employee involvement and placed them on a continuum as shown in Figure 5.1. The five approaches were: strict hierarchical; suggestion system; performance improvement team; job enrichment; and self-managing work team. As the figure shows, employee involvement increases as approaches to the right of the continuum are employed. On the right side, workers become involved in important decisions that demand their expertise and require their exercise of judgement.

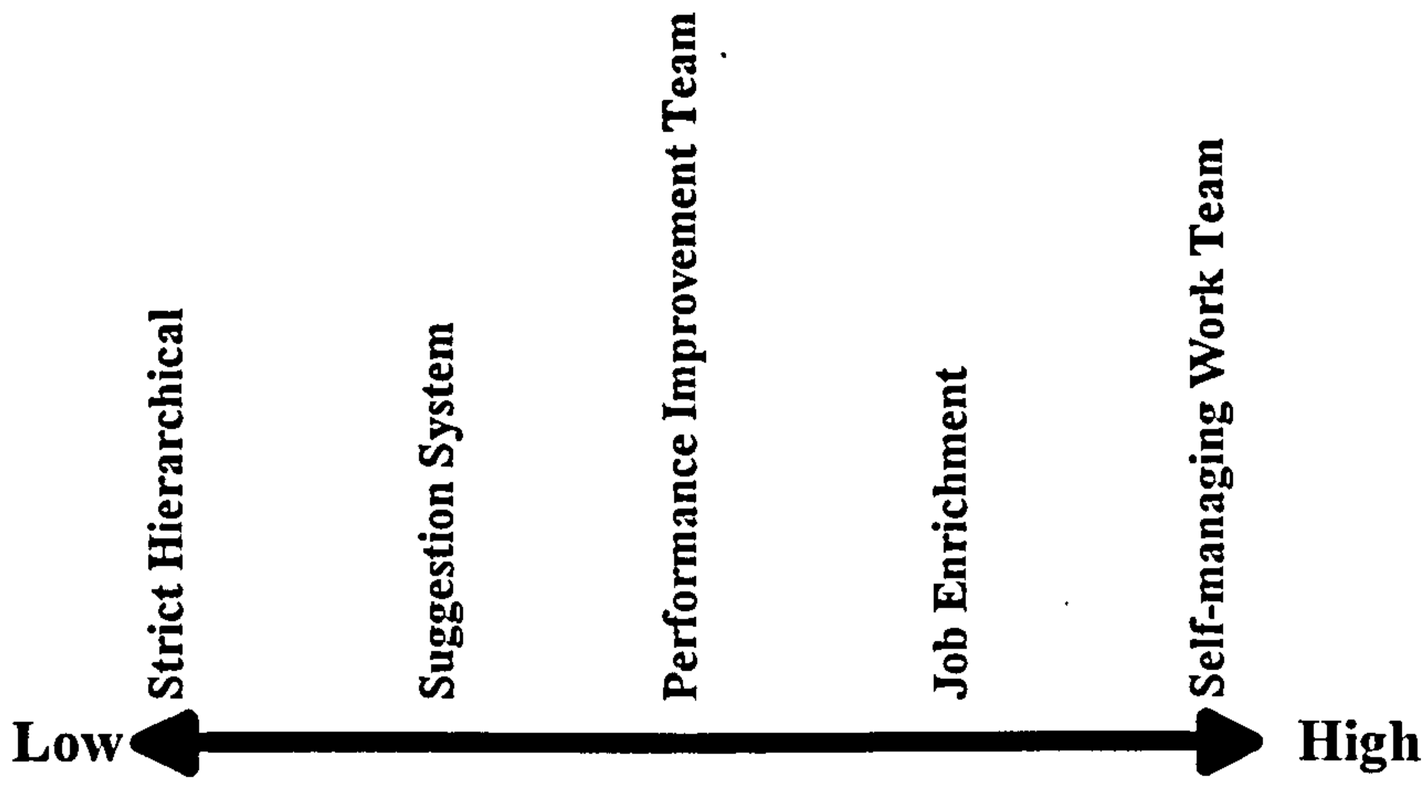
The approaches may be described as follows:

- Strict hierarchical: Decisions are made by top management and communicated to the workers. Involvement of employees consists of obeying commands.
- Suggestion system: Supervisors frequently ask for suggestions from workers and workers frequently offer suggestions. However, management controls their adoption.
- Performance improvement team: Management establishes a team that is charged with conducting an investigation and analysis of the issue and developing solutions to any

problems. However, management reserves the right to accept, modify, or reject the team's recommendations. The performance improvement team is a much more structured means of soliciting employee input than suggestion systems.

- Job enrichment: This focuses on the job design of the individual worker. Jobs are changed by providing more variety, identity, task significance, autonomy, and feedback such that workers have much more discretion in doing their work.
- Self-managing work teams: Employees with their work team, make decisions within the parameters established by management. The need for staff and supervisory positions is significantly reduced because the responsibilities of those positions are taken over by the teams themselves.

Figure 5.1: Employee involvement



(Adopted from Maloney, 1994)

Analysis of companies listed in Table 5.1 emphasises the last two of the above approaches, that is, job enrichment and self-managing workforce, for the effective implementation of empowerment. In practice, several techniques have been followed. At Geauga company

(USA), an Employee Involvement Programme was launched in 1989. The decision was made at management level and one employee was selected as the Program facilitator. Workshops were conducted for awareness and initial training. This resulted in the involvement of 45 % of the workforce. This level of involvement involved all participants - management as well as labour. This required a formal Employee Involvement Steering Committee to be established, comprising department managers, the Vice President of Operations, the president of the union, and the program co-ordinator. Lessons learned from the involvement programme have been: the programme should be assisted by professional advice; facilitators should be formally trained on communication skills, group dynamics and problem solving skills; and everyone's successes should be celebrated. A. O Smith Corporation (Shay et al, 1991) emphasised the need for broad participation, because, initially, their involvement programme was limited to minority of workers, and the programme failed to produce sufficient change to meet new challenges. Consequently, both union and management were trained by Participative Systems in Pinceton, New Jersey to serve as internal consultants and trainers for the joint process. At IBM Enterprise Systems (Smack et al, 1993) and Geauga Company, involvements were voluntary. It was realised that employee involvement in any programme would be most effective if it was voluntary and facilitated rather than mandated and taught.

The other side of the involvement programme is involvement of external participants such as customers and suppliers. For instance, an empowered service organisation might vest the front-line employee with the authority to make decisions in dealing with customers. In this case, customers should be informed of the new changing environment and involved with the system to understand their expectations or requirements. By doing this, both employees and customers are satisfied. Research indicates that empowerment is a strong predictor of job satisfaction, and there is also evidence that employee satisfaction correlates with customer satisfaction (Congram and John, 1993). At FM Corporation

(Willis, 1994), the procurement cycle has been greatly reduced by the involvement of the customer. Consensus on delivery needs, performance measurement and so on were reached between the customer and FM corporation. This greatly involved the customer in the internal working system of the corporation. Also, key suppliers were involved in the quality system and close communication was maintained in all matters. Suppliers were assisted in establishing process controls including training and technical aspects. The Naval Aviation Department (USA) has worked closely with its customers in improving business processes and even provided training to help them set up an acceptance process to provide thorough, consistent data. Some companies (Table 5.1) made visits to customer's and suppliers's premises to asses how the product fitted into the customer's demand and also saw where raw materials come from. At Loral Aeronautics (Tiernan, 1993), a direct contact between operators and outside suppliers was initiated to improve process. Operators met suppliers to show them how their product was used and resolve areas of dissatisfaction directly.

5.5.1 Involvement activities

The above discussion identified the following activities for efficiently involving employees.

- *Employee involvement:* Involvement of employees in their business related improvement activities, processes and cross-functional activities.
- *Customer (external) involvement:* Customers should be involved in the business so as to perceive their changing requirements and desired levels of satisfaction. This includes visiting customers' premises, inviting customers to visit the company, and accessing customer conferences and reports.
- *Supplier (external) involvement:* Suppliers are involved in the business to enable them to understand the company's business strategies and expectations.

- *Voluntary participation:* Encouragement of employees to participate voluntarily in the empowerment system. This includes participation in training and other empowerment activities.
- *Grievances filing:* Grievances of employees (resulting either from employer imposing detrimental working conditions on employees or from internal feelings of unhappiness and/or frustration) are filed, so that management can resolve them quickly and fairly.
- *Employees' satisfaction:* Management should continuously assess employees in respect of their satisfaction; and any dissatisfaction perceived should be analysed and rectified where necessary.
- *Customer satisfaction:* The level of customer satisfaction with the supplied product/service is ascertained through questionnaire surveys, personal interviews, telephone surveys, and seminars conducted within the customer organisation.

5.6 Education and training

Empowerment requires that employees exercise judgement to perform the right thing in their own business. This require them to be sufficiently educated and trained so that they can discern for themselves what that right thing is. Hammer and Champy (1993) stated that 'training' increases skills and competence and teaches employees the 'how' of a job, where employees are taught how to perform a particular job or handle a specific situation. Where as 'education' increases their insight and understanding and teaches the 'why'. However, different people at different jobs might require different skills to perform their jobs efficiently. This requires a systematic training process to be in place. Jeffries et al (1992) described the training process in four stages:

- Diagnosing: Diagnosis is about performing a detailed analysis to ensure that any subsequent training or learning experience is focused and contributes to improved

performance. During this stage the type of training, the individual, team, department or organisation in need is assessed.

- Learning events: Once the needs have been identified, then events relating to training needs should be learnt.
- Transferring the learning: Applying the learning back in the work place, i.e., not only application as part of a training event but also application in the workplace.
- Evaluating: In the training process, there are two customers: the learner or the recipient of training; and the recipient of the effect of the training - usually the learner's manager. Thus, two sets of customer success criteria should be taken into account in the evaluation of training.

5.6.1 Learning organisation

According to Hessney (1994), the critical principles for creation of a successful organisation are: people are the greatest asset of an organisation; the application of their skill and knowledge determines the level of the organisation's performance; constant global changes and rapid technological developments demand lifelong learning for all employees and organisations; effective training is absolutely crucial to maintain the dynamic, skilled workforce that this age of information requires; and employee capability development is a key strategic corporate thrust. It is noticeable that all of these principles emphasise one point; training. This insists that the whole organisation increases emphasis on human values to achieve the business goal, and starts from re-education of leaderships and passing through the whole organisation to build a strong followership. Steiger (1994) stated that this process requires training of leaders and leaders of leaders reaching into the entire organisation through two levels. The first level is fact transfer which is based on generic applications that relate to the change desired. The second is behavioural change, which addresses the practical applications that affect one's job and the new environment.

The key to the process is that the leaders at all levels have to be interwoven into the education process fully understanding their new roles.

5.6.2 Training areas

Several authors have proposed ideas on employees' training for empowerment. Pryor and Oaklay (1991) stated that training must emphasise leadership, decision making, and how to function as empowered individuals and teams. Otherwise employees will not be able to implement their innovative ideas. Sheridan (1993) stated that top managers will need to learn how to implement long range planning, respect people, and manage by fact. Middle managers must learn to lead the development of their employees. Finally, all employees should be required to learn problem solving, teamwork, statistical quality control, and conflict management. Artes (1994) stated that every individual should be required to learn and understand the four main business disciplines and their related business activities: (1) Operational, planning and control; (2) Product and process optimisation; (3) strategic initiatives and logistics; and (4) Human resource deployment. Willis (1994) stated that all associates and teams at FM Corporation have been trained in several areas, including team building, process improvement, meeting skills, effective communication, expected behaviour, process mapping, and problem solving. It is evident from the above that employees should be trained both on general issues, including organisation, vision, quality policy, procedures, and awareness, and on relevant (technical) skills necessary to improve their processes.

5.6.3 Skill development and training

Artes (1994) perceived two levels of understanding and knowledge required to effectively implement formal business management processes: the What and Why level; and the How-

to level. 'What' and 'Why' knowledge is an informational and motivational detail level that causes people to relate and link business concepts and principles together in a formal business environment, but it does not require skills to select and resolve business problems. Where as 'How-to' education causes actions toward solutions for a specific business activity. This helps employees in solving specific business problems or topics. The 'How-to' education is crucial for the improvement of process. In an empowered environment the directly involved workforce is the target, whose requisite skills should be identified and accordingly developed to meet the challenges of managing their processes themselves. In particular, where teamwork is employed, it may need a matrix of information identifying what must be done to meet their objectives and those with the skills needed to get the job done efficiently. The required team skills are: participation skills; meeting management skills; process thinking skills; problem solving skills; and presentation skills (Ribar, 1994). The study group of IBM (Smack et al, 1993), after evaluating programs used in IBM and other companies, concluded that an activity based learning approach should be adopted. Such an approach utilises techniques, tools and learning aids to present participants with opportunities to identify ways to improve as an empowered team. This concept has been well accepted in the literature (Turnquist, 1994; Maloney 1994). Maloney contrasted two training strategies of workers to posses technical skills: skill-based, and craft-based. A skill based approach to training involves the identification of discrete skill modules and training workers in the skills in a specific module. A craft-based approach involves training the worker in the set of skills required for the performance of the activities to be performed by a craft, e.g., carpenter, electrician, or plumber. Maloney argued that a worker trained with a craft-based approach is more likely to posses a broader set of skills than one trained under a skill-based approach. This is true in the sense of offering 'technical' knowledge to workers, however, in an empowered environment, the workers need to be skilled in other areas such as group dynamics, problem solving, performance analysis, and so on. In this circumstance, both

training strategies seem important for workers. The skill-based approach can be used to train workers on general skills such as level of reading, writing, and mathematical skills to effectively do any job in the organisation. Turnquist (1994) defined this approach as macro analysis; an analysis of job identification and required general skills for every employee to continuously improve (in the empowerment) system. The second one, craft-based strategy can be used to train employees on set of skills required to perform specific tasks and activities. Turnquist defined this approach as micro analysis. As stated by Maloney, if skill-based strategy is used for activity based learning, the resultant outcome may not be satisfactory.

The role of deciding training needs for each job category, individuals, and teams depends on the level of skills possessed by employees. At A.O. Smith Corporation (Shay et al, 1991), teams and supervisors identified training needs and planned the training together. In most of the organisation progressing with empowerment, top management, managers or supervisors have identified the required skills and initiated training plans. It is rational to expect management to identify training needs for the workforce until such time that the workforce obtain sufficient knowledge, to decide their needs themselves. For example, at IBM Enterprise, after receiving preliminary training, the workforce requested additional training in several areas: better definition and understanding of the changing roles of the leader/manager and team members; an interest in understanding team development stages with an ongoing desire to assess/benchmark team development levels; and the need for training in team competency skills. Where as the Aerospace Divisions at Westinghouse Electronic Systems Group (Nashold et al, 1993) used skill-based training to improve the skills of employees. The four lecture training modules were: manufacturing documentation; assembly drawing review; torquing; and adhesive fabrication and application. Performance after each module was evaluated through identification of

product defects and subsequent corrective actions. Finally, successful employees were certified as possessing necessary skills to monitor their own work.

5.6.4 Self managing training

Once the team/employee acquires enough knowledge to be capable for self-management, it is able to train itself without much involvement of supervisors and managers. Self-assessment of training needs is one of the crucial issues for the improvement of operations at plant level. The details of team roles and responsibilities have to fit operational needs, therefore training has to be worked out by those closest to operations. Therefore, at A.O.Smith Corporation, the training had been managed by plant-level advisory committees. Usually, self-managing teams integrate employees with diverse backgrounds and functional experience. Unlike the traditional 'division of labour' policy (where employees are specialised and skilled in their own functions) the empowerment approach requires team members to be skilled in related cross-functions. This demands that team members learn and understand the challenges and problems faced by each of the functions involved. Learning to think as a process and shed functional orientation means building a mutual responsibility for achieving the team purpose (Gillen and Kelly-Gillen, 1994). In a self-managing environment, the team members can share their own functional skills and knowledge with rest of the team members. This should enable them to transfer the skills acquired in one job to others in the same group. Graham and Bennett (1993) named this group as 'learning family'.

5.6.5 Education and training activities

The above discussion identified the following activities as essential for efficiently training employees:

- *Training:* Training of individuals and groups on implementation and use of various quality and empowerment tools. This includes training on statistical tools and team working.
- *Skill development:* Development of skills on technical, administrative, and interpersonal matters. These include production, problem solving, and communication skills.
- *Skill certification:* This is the process of testing employees after intensive training on various skills required to manage their own work. This ensures that certified employees are eligible to manage and inspect their own work.
- *Display boards:* Boards are set up at a visible places to provide an information centre for all employee improvement activities. Team meetings notices, minutes, and achievements can be displayed for everyone to read.
- *Posters:* Posters can be used to increase awareness on empowerment and provide recognition of achievements.
- *News letters:* News letters are used within the company to both increase awareness and recognise achievements.
- *Technical cross-training:* Training employees on various related specialised jobs. This allows team members to acquire different skills and move from job to job within the team itself, and thus engender flexibility and innovation within the team.
- *Empowerment awareness:* Establishing a common understanding of the concept of empowerment among employees. This enables employees to understand their role within the organisation and build an empowerment attitude into the business.
- *Supplier training:* Training undertaken by the supplier with the assistance of the purchaser to improve the quality of products/services being supplied. This also enables the supplier to understand the empowerment policy/system of the purchaser.

- *Self-managing training:* Teams or individuals identify their operational or functional training needs, and accordingly train themselves in achieving necessary skills to satisfy these needs.

5.7 Process improvement

Hammer and Champy (1993) define a 'business process' as a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer. Deming (1982) stated that quality comes from improvement of process. Both productivity and product improvements depend on the design structure of the processes that produces them. When processes are structured to align with objectives of the business, then the business would enjoy increased productivity and quality. Hence, it is necessary to understand the key processes involved in the business and subsequently improve them. To achieve these objectives effectively, process owners (empowered employees) for cross-functional processes are appointed (Rummler and Brache, 1990). A more radical solution is to let self-directed teams control their processes (Stewart, 1992). All these efforts are focused towards continuous improvement of the process, and should be both incremental and radical depending upon the requirements of the business in the course of improvement (Jawahar-Nesan and Price, 1996). Koskela (1992) identified the following methods for achieving continuous improvement into the process:

- Setting stretch targets (e.g. cycle time reduction), by means of which problems are unearthed and their solutions are stimulated.
- Giving responsibility for improvement to all employees; a steady improvement from every organisational unit should be required and rewarded.
- Using standard procedures as hypotheses of best practice, to be constantly challenged by better ways.

- Linking improvement to control: improvement should be aimed at the current control constraints and problems of the process. The goal is to eliminate the root of problems rather than to cope with their effects.

5.7.1 Process owners

In the successful operation of any process, it is essential to understand what determines performance and outputs. This means understanding process flows to eliminate bottlenecks and reduce waste (Oakland, 1994). To understand the process flow and analyse it for improvement, process owners must be identified and selected. This is often called as 'process ownership', i.e. authorising employees for the processes they own and making them accountable and responsible for them. Process ownership can be delegated to both individuals and teams. Many of the companies introduced in Table 5.1 have followed this approach. For example, the Aerospace Divisions of Westinghouse electronic systems selected process ownership as the methodology to expand its skills base, to facilitate the development of a flexible workforce, and to improve quality performance. In their process-ownership development programme, individuals selected for process ownership were trained to meet their handling requirements. After successful training, a new skill certificate was offered to employees, i.e. who have successfully completed the process ownership requirements. These owners 'earned' the right to state that their own product/service is acceptable per all quality standards, without relying on inspection.

The literature reports that the process ownership has worked well in a team environment (Shay et al, 1991; Stewart, 1992). The teams may be: a department level or a divisional level teams; teams of cross-functional nature; or a production team composed of supervisors, foremen and operatives. According to Joy and Joy (1994), one manufacturing company empowered its work teams to establish a new production

sequencing system by redesigning their plant. They needed to find a way to link the workcells and pull both customer orders and stock orders through the plant. This team was represented by both the supervisor and operatives. At A.O Smith Corporation, a joint management team comprising of members from mid-level management and operatives made significant operational decisions, to manage resources and support off-line problem solving teams on the shop floor. These teams also produced department improvement plans. These plans set priorities, identified resources, and established time frames necessary to meet improvements.

The main ingredient for the success of the process improvement activities is 'communication'. The team must have all of the information available to succeed with their objectives. Information is an extraordinarily powerful lever for the redesign of core processes (Ravikumar, 1994). All relevant information should be available at the point of need, otherwise the process will either be delayed or the person who is involved in the process will be tempted to take wrong decisions because of lack of information. In order to avoid this problem, a two-way communication has been emphasised, where all relevant information are shared between participants including feedback from top management regarding performance (Nelson, 1994; Pryor and Oaklay, 1991).

5.7.2 Problem solving

One of the main functions of self-managed teams is step by step problem solving. Properly managed and developed, such teams improve the process of problem solving, producing results quickly and economically (Oakland, 1994). TQM International Ltd (1992) describes the step by step problem solving process. The first step for the team is to identify and explain the nature of the problem; next the team identifies factors contributing to the problem and prioritises them in order of importance. Once this is completed, the

team determines a specific goal for improvement. Then the team identifies and verifies root causes of the problem and develops solutions to the most significant of these. The final solutions are implemented, their effectiveness checked and it is ensured that any recurrence of the problem is prevented.

5.7.3 Process evaluation

As stated earlier, the primary focus of process redesign is to eliminate non-value-added activities, minimise obstacles and constraints, and improve all baselines (quality, productivity, and safety). The process owner(s) plays a monitoring role to ensure that the process has been improved. In order to accomplish this, processes are evaluated using many techniques. A typical checklist for process evaluation includes:

- determine and list processes;
- identify customers and suppliers for each process;
- define quality for the output(s) from each process;
- determine total cycle time (process flow time);
- identify data sources;
- identify areas with greatest improvement potential;
- use TQM/SPC tools to determine system improvement/problem resolution options;
- select best improvement option(s) and implement;
- monitor results;
- continue improvement efforts; and
- publicise improvements (Pryor and Oakley, 1991).

5.7.4 Tools for process improvement

The process by which professional approach a problem involves a procedure beginning with diagnosis and ending with treatment. The diagnosis involves determining customers' requirements and the treatment being the design to achieve those requirements. Quality Function Deployment (QFD) is an appropriate tool that can be used in translating such requirements into quality characteristics. QFD as defined by Akao (1990) is:

"converting the customer's demands into 'quality characteristics' and developing a design for the finished product by systematically deploying the relationships between the demands and characteristics, starting with the quality of each functional component and extending the deployment to the quality of each part and process. The overall quality of the product will be formed through this network of relationships".

According to Avrick (1992), Mitsubishi Kobe Shipyards had first used QFD to determine the relative importance of functions responsible for quality in various areas of the company. Sandia National Laboratories (USA) used QFD to design a supercritical water reactor, in a team setting that brought customer and supplier into close contact and open interaction. The team constructed a 'house of quality' that listed customers' needs along with methods the supplier proposed to satisfy those needs. The team continued to refine the 'house of quality' until all members agreed on what the project required, how those requirements would be met, and the relative priority of the needs and methods.

Empowerment provides systems to perform various activities involved in a process. Unless and until such a system produces results that are 'in control', making changes through the new system may only worsen the situation. Controlling the system may involve numbers (quantitative data) and information which form the basis for

understanding, decisions and actions and a thorough data gathering, recording and presentation. The Japanese Quality Guru, Ishikawa (1985) provided 'seven basic tools' which can be used to interpret and derive the maximum use from data. The seven tools include: pareto charts; cause and effects diagrams; stratification; check sheets; histograms; scatter diagrams; and schewart's control charts and graphs. Success of quality improvement projects can be enhanced by proper application of these tools and techniques. BS 7850 (1992) gives a guidance on how and when to use these tools appropriately.

5.7.5. Process improvement activities

The above discussion led to identify the following activities for improving processes.

- *Problem solving:* Identifying and prioritising problems and finding appropriate solutions. This includes statistical analysis and plan-do-check-act procedures.
- *Joint labour/management problem solving process:* Teams comprised of both operatives and management plan and solve problems, developing broadly owned, jointly developed priorities for improvement throughout the organisation.
- *Department improvement plan:* Plans developed by individuals and/or teams within a department to improve activities and processes, controlled by the department.
- *Jobsite (plant) improvement plans:* These plans set priorities, identify resources and establish time frames necessary to meet jobsite improvement objectives. Both middle management and the lower level workforce are engaged in producing these plans.
- *Statistical process control:* Analysis of a process or its outputs using statistical techniques so as to take appropriate actions to improve the effectiveness of the process.

- *Process evaluation:* All processes are analysed and evaluated using a plan-do-check-act cycle to eliminate non-value-added activities, minimise obstacles and constraints and improve quality, productivity and safety.
- *Process ownership:* Authorising individuals and/or teams to take responsibility for their respective processes, and to be held accountable for quality they achieve and errors they commit regarding their processes.
- *Quality function deployment:* A system for translating customer requirements into company requirements at every stage of a business process. This is systematic deployment of the relationships between the requirements (customer) and quality of the product.
- *Lowered levels of decision making:* Employees at all levels of the organisation are empowered to take decisions related to their business operations within parameters established by management.
- *Two-way communications:* A continuous flow of information between management and employees, individuals, teams, and departments, on matters regarding process improvement.

5.8 Teamwork

As highlighted within the previous section, a prime task of empowered employees is identification of problems inherent within their processes and subsequent development of appropriate solutions and their implementation for further improvement. This can be enhanced if employees work as a team rather than individuals (Reiste and Hubrich, 1994; Handley, 1994; Gillen and Kelly-Gillen, 1994). Solving complex problems is normally beyond the capabilities of any one individual. Since teams are groups of experts amalgamated with inter-functional knowledge and skills, they can apply this critical mass of knowledge for the improvement of work processes. Oakland (1994) argued that the

only efficient way to tackle process improvement or problems is through the use of some form of teamwork. He further highlights the advantages of teamwork as follows:

- A greater variety of complex problems may be tackled by the pooling of expertise and resources.
- Problems are exposed to a greater diversity of knowledge, skill, and experience. Therefore solved more efficiently.
- The approach is more satisfying to members, and boosts morale and ownership through participation in problem solving and decision making.
- Problems that cross departmental or functional boundaries can be dealt with more easily, and potential/actual conflicts are more likely to be identified and solved.
- Group recommendations are more likely to be implemented than individual suggestions, as the quality of decision making in good teams, is high.

5.8.1 Teamwork process

Katzenbach and Smith define a team as "a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable" (Gillen and Kelly-Gillen, 1994). There are many types of teams within empowered organisations (Table 5.1): project teams, process teams, cross-functional teams, work teams, self-directed work teams, quality improvement teams, and steering teams and so on. Teams like 'project teams' and 'steering teams' are delegated to address a specific goal and have specific duration. Once the objective of these teams is accomplished, they are dissolved. Other teams such as process teams and self-directed work teams are permanent teams which are organised around functions, processes, and products. These teams run day-to-day business and contribute to achieving the company business objective. They develop and use checklists and

improvement models to ensure that continuous improvement efforts are compatible. All teams must have a designated leader, discussion leader, and recorder (Pryor and Oaklay, 1991). The team leader ensures that continuous process evaluation and improvement occurs. The discussion leader ensures that team meetings do not generate into non-productive sessions. The recorder documents team activities. Members are selected based on some common criteria (Northey, 1994) such as: understanding of the work design process and their role in it; willingness to change; communication skills; credibility in the workplace; ability to think; willingness to take risk; and voluntary participation. In order to enforce these skills in every member, education is provided on the work design process and team building exercises. The process of teamwork, usually, consists of the following six steps:

- A vision for process improvement is established. This includes bench marking of competitors, customer oriented process output, and measurable objectives.
- All steps in the process are mapped out and the time frame and cost measured.
- Preliminary suggestions for change/redesign in line with the established vision and objectives are developed.
- The process is further analysed for improvement. This includes feasibility analysis of costs/benefits, training and technological needs, and development of an implementation plan.
- Finally, the implemented process is monitored and results are evaluated (Northey, 1994; Ribar, 1994).

In all these steps trainers and facilitators guide the work team for improving the teamwork process. Managers and supervisors act as facilitators and lead teams through participation and empowerment. Their responsibilities include: delegating responsibilities to teams; creating a work environment that promotes open discussion of problems; embracing new

approaches ; inspiring sceptical team members to accept teamwork; motivating team members to be their best; and using statistics to evaluate performance (Pryor and Oaklay, 1991; Northey, 1994; Ribar, 1994). However, the decision on work process improvements is vested with the team itself.

5.8.2 Team building

Team building is a process jointly performed by both management and employees. Representation should be from all levels of management: employees from the work centre including employees of all shifts; supervisors; quality representatives; maintenance representatives; engineering representatives; management representatives; and training administrator (Shepherd, 1994). A steering team comprising of plant manager, manufacturing engineer, and production superindent can be set at the outset to develop and implement the team concept (Reiste and Hubrich, 1994). Then, a series of meetings are conducted where members brainstorm each other to identify: all equipment at the work centre; procedures and roles; and team size. In order to support the formation of teams significant changes should be made in the management structure. For example, at A.O.Smith Corporation (Shay et al, 1994), advisory committees represented by both middle level management and operatives were established at all departments and divisions. Work teams were formed around each advisory committee. The Advisory committee guided work teams in establishing vision, solving problems, and using quality tools in the work process.

One of the main objectives of the concept of empowerment is the formation of Self Directed Work Teams (SDWT) in the work place. Experience of many of the companies [e.g. Zenger-Miller (Musselwhite and Moran, 1991), SEMATECH (Handley, 1994)] who have implemented SDWTs evidenced that formation of SDWTs is a long term

achievement; the team gradually passes through many stages of evolution until it matures. Reaching the stage of self-direction took those companies from two to five years. The conventional approach of team development, i.e., forming, storming, norming, and performing is more suitable for the formation of short term teams such as project teams, quality teams and so on. Using this approach, members of the team can form together, brainstorm each other to arrive an acceptable norm of practices, and finally implement them to achieve short term goals. However, the formation of SDWT seems to deviated from this approach. The five stages of the development of the SDWT that have been followed in the SEMATECH company and Zenger-Miller are: start-up; state of confusion; leader-centered teams; tightly formed teams; and self-directed teams.

Start-up: Teams and supervisors form teams, and storm and norm their new roles. Prior to start-up, an executive steering committee explores the feasibility of SDWTs and develops a mission statement, and accordingly, the multi-level design team compiles a plan, selects the initial area to be implemented.

State of confusion: A period of confusion is expected, when roles are changed and new teams often have predictable difficulty in reaching co-operative decisions. Top management should inform teams of predictable problems and difficulties in their approach towards SDWTs. This reduces the agony and enables members to face such problems.

Leader-centred teams: Managers and supervisors continue to demonstrate their faith in the teams, consequently confidence grows as the teams master new skills. Finally, one team member emerges as team leader to interface with the organisation, clarify work assignments, and avoid internal conflicts.

Tightly formed teams: Teams manage their own scheduling, clearly express their needs, and meet their goals with limited resources. The one important factor left unresolved at this stage is 'team loyalty'. This creates competition among teams which lead one team to undermine the efforts of the other. The team members should understand that their success not only depends on the effectiveness of their team, but also on the success of other teams.

Self-directed teams: After the change of culture, the team takes self-direction. All team members continuously acquire new skills, seek out and respond to internal customer needs, and improve support systems.

5.8.3 Self Directed work teams

SDWTs perform multiple technical and administrative tasks and participate in group problem solving. Maloney (1995) highlighted the eight important activities of SDWTS: plan and carryout their work; measure performance results; analyse and control work processes; solve problems and make decisions; conduct meetings; co-ordinate with other teams; manage own interpersonal relations; and set and achieve challenging goals for improvement. To perform these activities effectively, Maloney suggests that SDWTs to have the following characteristics:

- Formed around a natural cluster of interdependent jobs.
- Forms a well defined segment of work.
- Size ranges from 5 to 18 members.
- Share responsibility for managing themselves and their work.
- Trained to develop several or all jobs on the team.
- Regular team meetings focus on continuous improvement.

- Fully accountable for decisions.
- Become as self-sufficient as possible.
- Organised around work.

5.8.4 Teamwork activities

The above discussion has identified the following activities as essential for efficiently implementing teamwork in empowerment:

- *Team meetings:* Teams of all kinds at all levels of the organisation conduct meetings frequently to analyse problems, improve processes, resolve conflicts, and celebrate acheivements. This includes meetings of inter and intra teams.
- *Self-directed work teams:* An intact group of workers who are highly trained, form a natural unit of work, to manage and co-ordinate their work activities with a minimum of direct supervision. These teams own responsibility for their performance.
- *Co-ordination:* Assisting individuals and/or teams to function together efficiently for a common goal.
- *Team building:* Formation of teams resulting from group cohesion, effective leadership and extensive interaction among team members, so that the members of the team co-operate, share common goals and possess common attitudes.
- *Advisory committees:* Committees represented by middle and lower levels of the organisation. These committees have the authority and expertise to make significant operational decisions, to manage resources, and support off-line problem solving teams on the shop floor.
- *Group decision making:* A group of individuals meets together, analyses an issue and decides upon effective solutions. The group can be within a team or department, or individuals from several teams depending on the type of issue.

- *Conflict resolution:* Resolving conflicts or differences that occur between individuals, teams or departments. This includes analysis of the issue that triggers the conflict, negotiations with parties involved, emergence of compromises, and final settlement of the conflict.
- *Cross-functional teams:* Teams comprised of experts or individuals from different functional areas and processes. These teams focus on improving cross-functional issues and activities.
- *Quality improvement teams:* Teams established at various levels of the organisation to improve quality of the service and producer. These teams help to train team members and other employees on quality tools, techniques and principles.
- *Goal setting:* Teams or individuals set goals for process improvement. These include: defining the object of the goal; the importance of the goal for both the individual and the organisation; the method by which the goal is to be achieved; and the degree of goal commitment.

5.9 Measurement

Performance measurements are the cornerstone for maintaining continuous improvement in an empowered organisation. Zairi (1994) stated that TQM-based performance is based on people productivity, their empowerment and involvement and giving them total ownership in the design, control and measurement of their processes. Thus, he described that performance measurement is about recording human activity and providing a stimulus for action with a view of continually doing better.

5.9.1 Characteristics of measurement

Tarr (1994) stated three characteristics (of performance measurement) that are important to the understanding of a performance measurement system: precision vs. accuracy; positional measurement vs. directional measurement; and intended vs. unintended consequences of measurement. According to Tarr, many measurement systems focus on the precision of measurement, (e.g. more decimal places). Such precision is intended to improve the accuracy of results. However, statistics used to analyse performance against standard by simply comparing expected with actual (without using standard deviation) limits the validity of results. The precision approach can only give answers such as good-performance/no good, yes/no. This type of measurement provides little access to the important information required for future actions. These are static measures locating the position of an attribute, being measured at a specific point in time or over a defined period of time. Where as directional measures provide the additional information of direction and velocity of change occurring in the attribute measured. Hence, extreme accuracy and precision are not as important. The intended consequence of performance measures is to encourage employees to aspire to certain standards and goals. However, performance measures are only indirectly related to goals. Further, people will modify their behaviour to maximise their performance against such and unintended consequences may also arise. To solve these problems, Tarr suggested the following elements in designing measurement systems:

- Precision should be no more than required by the inherent accuracy of the measure.
- Accuracy must be measured using both the mean value and the standard deviation to define the distribution of both the standard and the actual measure.
- Statistical validity can be improved by using groups of actual measurements compared to the goal rather than individual measurements.

- Directional measures must be used to supplement the information derived from static measures and to improve the statistical accuracy of the performance.
- The less quantifiable the characteristics to be measured, the more important directional measures become.
- Groups of measures rather than single measures must be developed to minimise unintended consequences of any performance measurement system.
- The measurement system must be constantly monitored to identify signs of dysfunctional behaviour resulting from the unintended consequences of people 'working to the measure' not the goal.

5.9.2 Measurement of empowerment

At the initial stage of the empowerment implementation, several companies listed in Table 5.1 conducted an organisation wide survey to diagnose the capabilities of employees and other resources. At A.O.Smith Corporation, a policy committee, including representation of external consultants, was formed in this respect. During and after the process of implementation, the extent of employee empowerment can be measured. Research by Hayes (1994), after a detailed survey of over 2000 companies, identified the following organisational variables that need to be measured to determine the influence of empowerment on organisational issues:

- Task variety: the extent to which the job allows an employee to work on a variety of tasks.
- Task autonomy: the extent to which employees have a major say in the scheduling on their work.
- Task identity: the extent to which an employee performs an entire piece of work.

- Task importance: the extent to which an employee's job has a major impact on other's jobs.
- Task feedback: the extent to which an employee receives information on how well the job was performed.
- Participation: the extent to which an employee is allowed to participate in decision making.
- Organisation-based self-esteem: the extent to which employees believe they are valuable, worthwhile, effectual members of the company.
- Management's commitment to quality: the extent to which senior management emphasises quality improvement in its practices.
- Supervisors' commitment to quality: the extent to which supervisors demonstrate quality improvement practices.
- Co-workers commitment to quality: the extent to which co-workers are committed to quality.

In that the above measures were tested for their reliability by studying over 2000 companies (by Hayes), they may be used by any organisation to study the influence of empowerment on organisational issues.

5.9.3 Self assessment of performance

Self-assessment is one of the crucial factors of the empowerment concept which eliminates the traditional 'inspection' role of superiors. Leech (1994) named this process as Control and Risk Self-assessment (CRSA). He defines CRSA as a process that allows groups to identify or refine the business/quality objectives that they should be fulfilling, while assessing the adequacy of the controls in place to meet those objectives. Self-assessment requires that organisations or work teams clearly define a set of business objectives along

with a set of attributes to measure performance. At Loral Aeronutronic (Tiernan, 1993), employees were certified to assess their performance or product/service after intensive training and testing.

5.9.4 Business performance measurements

Drucker (1973) identifies key requirements of an effective performance measurement system: economical; meaningful; appropriate; congruent; timely; simple; and operational. A much better approach is to align performance measurement along natural business processes which have been engineered to eliminate waste and whose customers and suppliers of services agree upon the quality, delivery and time investment goals (Pelphrey, 1994). Therefore, Pelphrey recommends the freedom for each individual to participate in the design of business processes and respective measurements. In the process of never ending improvement, Dale and Plunkett (1990) and Oakland (1994) both suggested two ways for measuring performance:

- Comparing performance against internal standards (process control and improvement) including scrap costs, customer complaints, and defect reports.
- Comparing performance against external standards (bench marking) using published information, and visits to companies.

These measures provide an overall insight on how to improve the performance of the entire organisation by checking with the internal and external best practice standards. The overall objective of external bench marking is to identify best practice and to set performance targets with the objective of achieving a competitive edge. A study undertaken on behalf of the RICS by the University of Reading (1995) illustrates bench marking as a process that enables firms to compare their profitability and productivity with

that of other firms, to identify areas which are unsatisfactory, to set targets, and to take action to improve their performance. Although external bench marking is necessary for survival, internal performance measurement is the cornerstone for empowerment to be effective. There have been many suggestions on internal performance measures in the literature. Steiger (1994) suggested quality, inventory, productivity, innovation, and employee empowerment as internal measures for the empowerment organisation.

- Quality: This includes major changes in the way products are designed, that relationships with suppliers are maintained, and employees are educated and trained.
- Inventory: This includes not only the optimisation of inventions, but also the elimination of waste in set-up times and the overall reduction of inventories.
- Productivity: The traditional ways of productivity measurement are value added per employee or output per direct labour hour. However, Steiger argued that these measures cannot be related by looking at aggregate data from (say) a profitability statement. It requires a very detailed look at units produced, labour used, materials processed, and capital utilised. At Hypro Corporation (Sneen, 1991), measures used for cost reduction were on-time performance, cycle time reduction, work-in-progress, inventory reduction, and direct labour savings.
- Innovation: This includes every aspect of a manufacturing/construction process. New technologies should be tapped into every resource so that work processes would be updated with new technologies.
- Employee empowerment: This includes ability to measure the skills, training, and morale of the workforce. The goal should be an order, a contract, or elimination of waste. Potential measures for training include: employee satisfaction with the training, performance in knowledge learned, and performance in skill or knowledge applied (Hessney, 1994).

Congram and John (1993) stated that process measures might include employee satisfaction, employee turnover, and indicators that the delivery activities performed confirm the design. The resultant measures should include customer satisfaction and productivity indicators. At Eastman Kodak Company (Weed, 1992), one of the goals of process management was to provide low cost utilities to customers. Possible areas of improvement identified to achieve this goal within the process were: reduce compressor air usage; reduce soot blowing steam usage; and reduce Auxillary Equipment Electricity usage. Consequently, the quantifiable measures for process improvement have been: air flow/day/and £/year; number of soot blows/day and cost/year; and run time/motor and cost/year. Such measurements were recorded and retrieved for future performance assessment.

For teamwork efforts, Ribar (1994) suggested two kinds of measure. The first is to measure the effectiveness of the work team process. This is often achieved simply in terms of team solutions implemented. The second type of performance measurement is the work team's progress toward their selected objective or goal. Measuring personal feelings of team members is one important measure to assess team dynamics. The six critical measurements as suggested by Nelson (1994) include: understanding of objectives; trust on others; supporting others; open communication; listening to others; and resolving conflicts. Such measurement can be conducted at every team meeting. At Raymond Corporation (Sheldon, 1994), performance review meetings were held at least weekly with participation from employees who performed the functions. Measures were reported at these meetings and ideas were promoted for further improvement. This accountability and ownership in the system assures greatest potential for success.

Conforming to customer quality requirements and on-time delivery remain critical factors for corporate success. FM Corporation (Willis, 1994) used some important categories to

measure customer satisfaction including: overall satisfaction; overall product/service quality; personnel; order processing; delivery; pricing/value; meeting customer needs; facilities; and additional feedback. According to Zairi (1994), the European Quality Award (EQA) provides the following measures for customer satisfaction:

- Product and service quality: capability of meeting specification; defect, error, reject rates; on-time delivery; responsiveness and flexibility; support; warranty and guarantee provisions.
- Indirect measures of customer satisfaction: complaint levels; customer returns (by value and quality); re-work levels; accolades and rewards received.

Research by Mann (1992) developed a new 'performance measurement system' to accurately measure business performance at each organisational level reflecting the breakdown of an organisation's vision, mission, strategies, and goals (Table.5.2). Table 5.2 illustrates most of the measures discussed above. He splitted the measures into two: Strategic Business Performance measures (SBP); and Operational Business Performance (OBP) measures. SBP measures refer to those typically addressed by corporate management. They are concerned with an organisation's performance in terms of major corporate goals. OBP measures are addressed throughout the organisation by both management and employees. These are concerned with recording on a daily or weekly basis. It has been proved in Mann's research that the OBP measures are likely to have an effect on SBP. The measures were developed within the context of the manufacturing process, however, some (such as people, customer, supplier and SBP measures) are applicable to any business organisation, because, the sample data based on which they were derived included other business organisations such as construction and service.

Table 5.2. Measures to assess OBP and SBP .

Strategic business performance measures	
Profitability	Sales revenue
Growth	Exports
Social responsibility	Productivity
Environmental control	Total cost
Market share	Employee welfare
Changes in customer base	Sales turnover
Return on capital employed	Shareholders dividends
Operational business performance measures	
1.Supplier (relationship) measures:	
Vendor performance	Supplier certification
Supplier delivery performance	Material availability
Supplier communication	Supplier price
Supplier product quality	Number of suppliers
Lost production due to supplier material	
2. Process measures:	
Work in progress	Downtime
Lead time	Machine breakdowns
Product quality	Process capability
Preventative maintenance	set-up reduction
First time pass rate	Throughput time
Product standardisation	Cycle time
Flexibility to execute changes	Capacity utilisation
Number of engineering changes	Scrap
Rework	Number of defects
Internal customer/supplier performance	Downtime
3. Policy deployment measures:	
Business control	Operating expense
Quality costs	Working to schedule
Departmental performance	Departmental spending
Sales forecast accuracy	Team performance
Targets/goals	Quality audit results
Common understanding of strategy	
4. People measures:	
Performance appraisal results	Output per employee
Per cent of employees involved in teams	Absenteeism
Skill level of employees	Employee moral
Department communication	Employee communication
Education and training	
5. Customer relationship measures	
Customer complaints	Customer service
Customer communication	Deliver as promised
Customer satisfaction survey results	Market research
Product returns	Product replacement
Product liability	Quality reputation

(Adopted from Mann, 1992)

The concept of performance indicators at different organisational levels is well established for manufacturing and general business (e.g. Oden, 1993; Shores, 1989; Dixon et al, 1990). In construction, there are several indicators reported under different contexts. For instance, research by Ahmed and Kangari (1995) identified six client-satisfaction measures: time, client orientation, communication, cost, response to complaints, and quality. Chan and Tan (1995) identified four measures with respect to project performance: budget, schedule, performance, and client satisfaction. According to Garsdon (1995), the two performance criteria for a construction company include: final job cost, and timely execution of works. According to Shah and Murphy (1995), the performance measurements should include: quality and quantity of work, resourcefulness, dependability, and communication skills; and capability, including initiative, analytical ability, mental alertness, ability to represent the firm, leadership potential, competence, and ability to manage a crisis. Naoum (1991) established measurements for project performance, including: pre-construction time (number of weeks from start of detailed design to start of construction); construction time (number of weeks from start on site to practical completion of the project); total time (number of weeks from start of design to completion of the project); speed of construction (gross floor area by the construction time in weeks); unit cost (cost of building by the gross floor area); time overrun (increase or decrease on the estimated programme in weeks); percentage cost overrun (increase or decrease in budget); and client satisfaction. Research by Holt (1995) identified 49 potential measures for contractor selection, which included almost all of those in Table 5.2. However, the research finally included only those measures which are significantly important for the contractor selection process. Research conducted by the Building Research Group of the Federal University of the State of Rio Grande do Sul (Brazil) in conjunction with the Association of Building Contractors and Agency for the Support of Micro and Small Businesses of Brazil, established performance criteria for a building

organisation, which included both organisation level and project level performances (Carlos et al, 1995). The following lists only those measures other than design measures.

Supply system

- Number of non conformities in the delivery of materials.
- Average delay time in the delivery of materials.

Post occupancy support

- Number of complaints from the users.

Sales and marketing

- Average time for selling the units (e.g. flats, offices.).
- Level of user satisfaction.

Production

- Percentage of material waste for steel, premixed concrete and bricks.
- Average thickness of external plaster.
- Man-hours consumption for form-work, reinforcement, brickwork and plastering.
- Man-hours spent in re-work.
- Percentage of non-productive time.

Human resources

- Relationship between the number of accidents and the number of workers.
- Relationship between the number of lost man-hours caused by accidents and the total number of man-hours.
- Labour turnover index.
- Number of absences in relation to the number of employees.
- Number of ex-employees who take legal action against the company.
- Relationship between the number of hours of training provided by the company and the number of employees.

Administration

- Relationship between the administrative costs and the firm's turnover.
- Relationship between the financial costs and the firm's turnover.

It can be seen that most of the performance criteria specified for construction organisations seem to be similar to those formulated by Mann (Table 5.2). In essence, the business performance measures for construction organisations are illustrated in Table 5.3 .When formulating the list of OBP measures it is helpful to consider an organisation in terms of its inputs, transformation, and outputs to ensure all elements of the organisation are addressed (Crawford et al, 1988; Mann, 1992). Thus, the classification system shown in Table 5.3 is developed in the light of contractors' business process, whilst taking into account empowerment-based measures related to people, process, and external relationships.

Some of the measures (Table 5.3) were used to assess the effects of empowerment implementation in companies investigated in this research (see Appendix C). Both structured interviews and documented evidence (if available) were used to: identify whether companies measure the effects of empowerment activities; and observe their effects on both SBP and OBP.

Table 5.3. Measures to asses OBP and SBP for construction organisations

Strategic Business performance measures:
Profitability; Return on capital employed; Growth; Employee welfare; Firm's turnover; Shareholders dividends; Market share
Operational Business Performance measures:
Process:
Work in progress; Speed of construction; Product quality; Cycle time; Construction time; Re-work; Total time; Reliability of cost-estimate; Number of defects; Percentage of material waste; Number of construction changes
Policy deployment:
Quality costs; Departmental performance; Targets/goals; Working to schedule
Team performance; Quality audit results
People:
Performance appraisal results; Skill level of employees; percentage of employees empowered; employee communication; department communications; number of accidents; Absenteeism; Education and training; Employee morale; Employee turnover index; Productivity of employee.
External relationship:
Customer complaints; Supplier delivery performance; Customer/Supplier communication; Customer satisfaction survey results; Supplier product quality; supplier certification; User satisfaction (post-occupancy evaluation); Deliver as promised.

5.9.5 Measurement activities

The above discussion has identified the following measurement activities as essential in the implementation of empowerment:

- *Job performance evaluation:* Continuous evaluation of performance of employees on their related job. This includes: product/service deficiencies; skill improvement; and productivity.
- *Benchmarking:* A formal process of measuring and comparing the company's product, process or service against those of the top performing companies in industry.
- *Self-assessment of performance:* Individuals of teams are empowered to assess the quality of their own performance at their own functions. They are thoroughly trained in this respect.
- *Diagnostic survey:* A survey or audit is conducted to assess the capability of the organisation to adopt the empowerment concept. This is used at the beginning of the empowerment process to highlight problem areas.
- *Documentation:* Recording an act, condition or event which bears an effect on the objective of the relevant process. This includes recording both the success and failure of efforts spent on the process.
- *Inspection:* Measuring and testing products, processes and services against predetermined goals or standards.
- *Sampling:* A group of items or individuals, taken from a larger collection or population, that provides information needed for assessing characteristics of the population.

5.10 Recognition

Maslow (1970) identified a hierarchy of needs consisting of five levels: 1) physiological; 2) safety or security; 3) social; 4) esteem; and 5) self-actualisation. Pilcher (1992) stated that the two lower level needs (Physiological and safety or security) can be satisfied by providing financial compensations such as good wages, supplementary benefits like pensions, health, holiday pay and some protection from dismissal. The three higher levels

tend to be satisfied by job attributes such as independence of action, increased responsibility, recognition and public endorsement of success, a challenging job, creative task demands, a high status job title, and freedom in decision making. Many experts (Kanter, 1989; Rosenau, 1992; Turner, 1993) agree that 'achievement' and 'recognition' are the most powerful motivators. Deffenbaugh (1993) stated that recognition promotes teamwork on the job and pride in one's work. He suggested that this can be accomplished by using positive reinforcement in the form of 'crew of the month' or some other similar award. On the other hand, Nelson (1994) suggested that recognition should be to the whole team instead of the individual. Rewarding a team leader or individual results in a negative effect on others. Recognition can also be accomplished by rewards in the form of cash or prizes, but research by Sanders and Eskridge (1993) revealed that several people had achieved significant success with recognition as opposed to rewards.

5.10.1 Management's role in recognition

A recognition system is important because it offers incentives for improving quality and productivity. Proescher (1994) suggested that the entire enterprise must be integrated into the recognition system. Investments must be made in the entire business to generate return to the bottom line. Milas (1995) advised that a recognition programme must be consistent with a company's values and principles. For example, if the company's vision is empowering employees to improve process and achieve customer satisfaction, recognition must be given for performance improvement in this respect. Recognition is not managing to maximise productivity, instead it is a matter of dealing with internal motives of employees to make them involved in the process with a greater enthusiasm. Management's role, here, plays a greater role in establishing an unbiased and reliable recognition system that satisfies all employees. Milas quoted the following key attitudes and behaviours of top management when starting an employee recognition initiative:

- Sincerity: The recognition programme must be founded in a sincere and honest desire to recognise individual and group accomplishments that have led to the success of the company.
- Fairness: Recognition programmes must provide equal treatment for all accomplishments.
- Appropriateness: Clear and definitive procedures must be set and applied to all of the rewards given.
- Consistency: The policies and procedures must be consistently applied throughout the organisation.
- Timeliness: Recognition and subsequent reward must be timely to the achievement.
- Importance: Managers, supervisors, and executives must be given the opportunity to share in another's success by having the time and occasion to join in the moment. This enables recipient to feel that they are the focus of all activity for the moment.

5.10.2 Forms of recognition

Recognition can be given both in private and in public. It takes various forms: gifts such as money, T-shirts, presentations, certifications and so on. For example, at Westinghouse Electronic Systems Group (USA) (Nashold et al, 1993), a certification system was introduced to recognise employees who have possessed sufficient skills to take ownership of process. At a small awards ceremony, the operations manager presented a Skill Code 40 stamp (Department system for skill classification) to each certified assembler. This enables the skill code 40 personnel to receive positive personal recognition and job enrichment. Recognition can also simply be presentations by team or individuals on their accomplishments. According to Williams (1994), in one manufacturing company, a team was assigned with a task to solve a particular problem. Consequently, the team came up with a solution to solve that problem. The senior management encouraged them to

present the solutions before a mass of employees. After the presentation, management approved the solutions without any modifications, although the proposed solutions incur money. The efforts of the team were praised in front of the entire work force. The following are some innovative ideas for employee recognition as suggested by Milas (1995):

- Reward with gift certificates. The company can award grocery, gasoline, or restaurant certificates.
- Involve another person. if sports, theatre, or dinner tickets are considered, award them in pairs so that the recipient can bring along a guest. For special occasions, send a reward (such as flowers) to the recipients' home so that their family or friends can also share the moment.
- Celebrate victories as a team when a reward is given to a team. For example, companies can book a bus for a day trip to a local attraction, hold a cookout complete with hay rides, arrange a dinner at a restaurant, or cater a lunch at work.
- Make a gift to charity in the name of the recipient. This is extraordinarily powerful if there is a special charity or cause that is of great interest to the recipient. A similar effect can be obtained by giving a suitable gift to a favourite institution. Some companies match rewards at the corporate level, thereby doubling the original amount. In any case, a formal notice and receipt should be given to the individual and public disclosure made of the gift.
- Involve customers and suppliers. Accomplishments that benefited suppliers or customers can be celebrated by including them in the festivities.
- Personalised trophies, plaques, and certificates. Generally, these types of rewards should be avoided because they tend to lose their significance with time and are eventually tossed aside and forgotten. If a trophy, plaque, or certificate is used, it should at least be personalised with the recipient's name. A certificate can also be

packaged in an attractive frame that might later be used for pictures of family or friends.

- Give savings bonds. Bonds in the employee's name or that of the employee's child can be given.

5.10.3 Recognition activities

The above discussion has identified the following critical activities for effective recognition of employees' accomplishments:

- *Reward system:* A formal system for recognition of empowerment achievements of employees. This can be financial, prizes or simply thanks to individuals or teams who have accomplished performance achievements in their business.
- *Award ceremony*: A meeting is conducted in order to celebrate individuals' or groups' achievements. Small gifts can be presented to the celebrities.
- *Presentations:* Presentations to management or all employees are performed by individuals or teams to explain their quality or productivity achievements.

5.11 Summary

This chapter has analysed the nine major propositions (empowerment elements) of this research both from theoretical and practical point of view. It has developed groups of respective empowerment activities (sixty-two) attributable to each of the nine empowerment elements. So far, this chapter has achieved the aim of the part-1 investigation (see chapter 4) of this research; i.e. developing (theoretical) constructs for further investigations. Having identified these activities, subsequent chapters (chapter Six and Chapter Seven) investigate in detail: how these activities are critical for implementing

empowerment within construction organisations; and how these activities contribute in the overall implementation process of empowerment.

Chapter Six

Evaluation of Empowerment Activities and Their Current Usage

6.1 Introduction

Having identified key empowerment activities from the literature review (Chapter Five), this chapter goes on evaluate them in terms of applicability to the construction sector. This was achieved using data obtained from a structured, postal questionnaire survey. The main objectives of this survey were to: assess perceptions of both construction and manufacturing sectors on the said empowerment activities; identify the extent of use of each activity in both manufacturing and construction sectors; and assess the degree of organisational (different levels of an organisation) involvement in performing those activities. The validity and rationality of this survey (process) was discussed in detail in Chapter Four. The sample included the manufacturing sector, because initial propositions concerning empowerment activities, were developed from the experience of manufacturing companies who have successfully implemented the concept.

A structured questionnaire (see Appendix A) was used to achieve the above objectives of this survey. The questionnaire was designed to satisfy several lines of inquiry including, level of respondents' agreement with the importance of activities, the extent of each activity being used within organisations, and the significance of employee involvement in each of the empowerment activities. Consequently, data obtained from a total fifty-three construction and manufacturing organisations were analysed in line with the above inquiries. Accordingly, the results are carefully interpreted and discussed in this chapter.

6.2 The Survey Sample

Fifty three of the 300 questionnaires mailed to both construction and manufacturing organisations in the UK were completed and returned (a response rate of 17.7 per cent). A considerable number of respondents returned questionnaires unanswered, reporting several reasons including: lack of knowledge on the concept of empowerment; not currently implementing empowerment; and lack of time to complete the questionnaire. The respondent sample of 53 consisted 27 companies from the construction sector and 26 companies from manufacturing. The 27 construction respondents were characterised in terms of 5 sub-groups as detailed in Table 6.1.

Table 6.1. Construction Sample Sub-groups

Company type	Number	Percentage Frequency
(1)	(2)	(3)
Civil engineering	2	7.4
Building	13	48.2
Engineering	5	18.5
Offshore	1	3.7
Civil and Building	6	22.2
Total	27	100

Further analysis of respondents' level of experience with, and awareness of, empowerment showed that they were adequately experienced to provide reasonable answers to the research investigation. Table 6.2 confirms that 41 per cent of construction and 31 per cent of manufacturing respondents had greater than or equal to 21 years of business related

experience. The majority had full awareness of the empowerment concept (Table 6.3) whilst 34 per cent had implemented empowerment for 5 years or more (Table 6.4). More than 90 per cent of construction and 100 per cent of the manufacturing respondents were aware of empowerment, and approximately 75 per cent of the construction and 85 per cent of the manufacturing respondents were implementing empowerment to some extent, within their organisations. The fact that respondents were knowledgeable on, and experienced with, the implementation of empowerment, then means that validity of the inferences drawn from this sample are underlined.

Table 6.2. Respondents' Experience (Construction/Manufacturing)

Experience in years	Construction(%)	Manufacturing(%)	All sample(%)
(1)	(2)	(3)	(4)
0 - 10	25.9	30.8	28.3
11 - 20	18.5	19.2	18.9
21 - 30	40.7	30.8	35.8
Above 30	14.8	19.2	17.0

Table 6.3. Respondents' Awareness on the Concept of Empowerment

Awareness	Construction(%)	Manufacturing(%)	All sample(%)
(1)	(2)	(3)	(4)
Not at all	7.4	0	3.8
Some awareness	29.6	19.2	24.5
Full awareness	63.0	80.8	71.7

Table 6.4. Empowerment Implementation

Implementation in years	Construction(%)	Manufacturing(%)	All sample(%)
(1)	(2)	(3)	(4)
Not at all	26.6	15.4	20.8
1 - 3	40.1	23.1	32.1
3 - 5	11.1	15.4	13.2
Above 5	22.2	46.2	34.0

6.3 Questionnaire and data inquiry

The survey was designed to assess initial literature search findings concerning empowerment activities in three different dimensions:

- respondents' *agreement* on the importance of the empowerment activities;
- the extent of each activity being *used* within their organisations; and
- the level of *involvement* of employees in empowerment at four levels of the organisation [strategic, general, operational, and direct work (see Chapter Two for four levels)].

Activities and respective definitions, as developed from the literature, were presented to respondents through a structured postal questionnaire (see Appendix A). Two Likert scales (agreement of importance and usage) each consisting of five integers were provided against each one of the sixty two activities in order to measure perception: i) in terms of importance of these activities; ii) and the extent to which they were currently being used. A third Likert scale (involvement) also comprised of five integers, and was provided

against each of four organisational levels (strategic, general, operational, and direct work) for each of the nine empowerment elements (note elements, not activities). As a reminder these elements were: leadership, resources development, involvement, recognition, empowerment system, process improvement, education and training, measurement and teamwork. This latter scale measured the degree of significance with respect to involvement of employees, in performing the activities. To clarify these objectives, each of the scales is reproduced below:

Agreement scale

(To determine agreement on the importance of empowerment activities.)

Strongly disagree Strongly agree

1 2 3 4 5

⟶ (Increasing agreement on importance)

Usage scale

(To measure current usage of empowerment activities.)

Not at all using Using fully

1 2 3 4 5

⟶ (Increasing degree of usage)

Involvement scale

(To measure employee involvement in empowerment activities.)

Strongly insignificant strongly significant

1 2 3 4 5

⟶ (Increasing degree of significance)

Prior to this industry wide survey, expert opinions were sought from identified experts (both manufacturing and construction) in order to establish that the questionnaire had not omitted any empowerment activities, and second, to check the appropriateness of the

activities. This expert opinion was sought by postal survey. (These experts were identified from literature as involved in the implementation of TQM and empowerment related activities). Eighteen experts consisted of nine each from manufacturing and construction. All confirmed the activities as necessary for empowerment implementation, and only a few minor corrections concerning the definitions of activities were received. Accordingly, the questionnaire was revised and used for the industry wide survey.

6.4 Statistical tests used in the analysis

Data obtained from the survey were subjected to several statistical tests including; relative indices calculation for agreement, usage and involvement factors, frequency analysis, Analysis of Variance (ANOVA) for each activity, and cumulative distribution percentiles for each element.

Relative indices and Frequency analysis

Relative indices were calculated by using the formula: Index = $1(n_1)+2(n_2)+3(n_3)+4(n_4)+5(n_5)$ / $5(n_1+n_2+n_3+n_4+n_5)$, where: n_1 to n_5 represent the number of respondents indicating respective categories on the scale (1 to 5). The formula yields indices ranging from 0.2 to 1, where 0.2 represents minimum strength of agreement (or usage) and 1.0 represents maximum strength (Holt et al, 1996). The relative index technique has been well tested in similar contexts by several researchers (Bubshait and Al-Musaid, 1992; Shash, 1993; Kometa et al, 1994; Holt et al, 1996).

The frequency analysis involved calculation of the frequency of respondents' rating on the measurement scales provided against each question. Both relative index analysis and frequency analysis employed for each of the activities, were designed to measure: the sample's agreement on the importance of the empowerment activities; the extent to which

the activities were currently being used; and the significance of the involvement of different levels of employees in performing those activities.

ANOVA and Cumulative distribution graphs

The ANOVA was employed by splitting the sample into three different groups: industrial bias; implementation; and awareness. That is, 'industrial bias' = construction and manufacturing, 'implementation' groups = (group 1-not at all implemented, group 2-implementing 1 to 3 three years, group 3-implementing 3 to 5 years, group 4-implementing above 5 years), and 'awareness' groups = (group 1-not at all aware of the concept, group 2-little awareness, group 3-neutral, group 4-awareness, group 5-full awareness). The ANOVA observed any differences among these groups. Since each of the above sub-groups has an average of 10 respondents, the application of ANOVA is methodologically valid. To further explore the degree of differences amongst groups, cumulative distribution graphs were also used

Cumulative distribution percentiles

To assess respondent companies on their range of implementation of empowerment activities, the 'cumulative distribution percentiles' test was used. This analysis was employed to measure (or benchmark) the extent of empowerment in a particular organisation, and its use achieved two objectives: 1) Empowerment Implementation Profiles (EIP) were developed against which companies can benchmark their extent of empowerment (with respect to the EIP model developed from the experience of 19 construction organisations); and 2) high-profiled empowerment organisations were identified to later be targetted as case studies for this research. The 'cumulative distribution percentiles' test has been used by other researchers for similar purposes (Slevin and Pinto, 1986; Handa and Adas, 1996).

6.5 Data analysis and discussion

6.5.1 Importance of empowerment activities

Frequency analysis was performed for each of the sixty-two activities, by grouping responses to the five integers (as described earlier) of the agreement scale into three regions: 'agree' (combining categories 4 and 5); 'neutral' (category 3); and 'disagree' (combining categories 1 and 2). Percentage scoring of 'agree' region of the scale was calculated for each of the sixty-two activities (separately for construction, manufacturing, and total sample), and presented in Appendix B (part I). It can be also seen in the appendix median values calculated for each of the activities. The median scores represent the central tendency of responses. Since the measurement scales used in this research were ordinal (not continuous) 'median' analysis was preferred than 'mean' for central tendency. The analysis indicated that more than 80 per cent of respondents (both construction and manufacturing) perceived all of the empowerment activities presented to them as being critical for the implementation of empowerment (Table 6.5). Collectively, Table 6.5 presents the average percentage scoring of > 3 on the scale for each respective activities, attributed to each of the elements. To support the findings of frequency analysis, the median scores calculated for each of the activities concentrates either 5 or 4 on the scale. This means that the activities are either 'strongly agreed' or 'agreed' as important for implementing empowerment. However, the activity *setting up advisory committees* received a lowest mean score of 43.4 per cent. Both manufacturing and the construction sector rejected this activity with agreement scores of 38.5 per cent and 48.1 per cent respectively. The agreement indices calculated for all of the activities showed similar levels of agreement (i.e. both in construction and manufacturing). Agreement indices for each of the activities can be seen in Appendix B (part I). As an abstract, Table 6.6 shows that the mean indices for all of the nine major empowerment elements are above

0.79, confirming concordance in views between construction and manufacturing. However, as perceived in the frequency analysis, the activity *advisory committees* has resulted in agreement indices of 0.69 and 0.67 for manufacturing and construction respectively. Since both the frequency analysis and relative index analysis have shown poor agreement for this particular activity, it was removed from the empowerment activity model.

The usage indices calculated for each of the activities resulted in mean indices ranging between 0.51 and 0.73 (Column 4, Table 6.7). This indicates that these activities are considerably used by the sample, further confirming the argument that they are important in empowerment implementation. In essence, all of the activities, except *advisory committees*, were perceived as critical by both manufacturing and construction for effective implementation of empowerment.

Table 6.5. Empowerment activities - Average Percentage Scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	All Sample
(1)	(2)	(3)	(4)
Leadership	86.7	89.0	87.8
Resources development	85.1	89.7	87.4
Involvement	85.1	84.1	86.5
Recognition	77.7	73.1	75.5
Empowerment system	70.8	68.5	70.2
Process improvement	83.7	91.9	87.7
Education & training	80.3	85.4	82.8
Measurement	72.4	76.9	74.6
Teamwork	85.5	83.8	84.7
Average percentage	80.81	82.49	81.91

Table 6.6. Empowerment Activities - Relative Agreement Indices

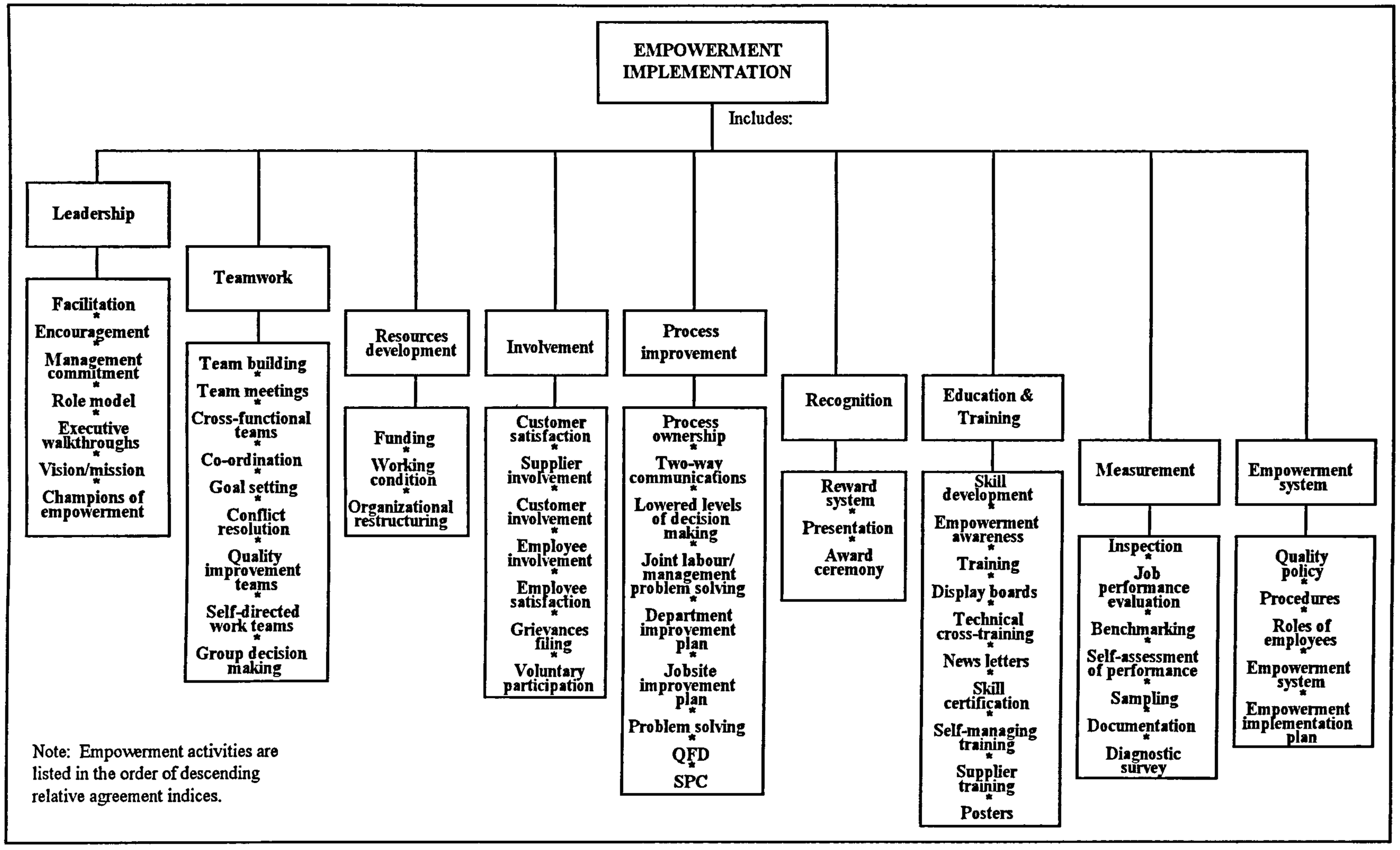
Activities	Construction	Manufacturing	All sample
(1)	(2)	(3)	(4)
Leadership	0.86	0.90	0.89
Resources development	0.84	0.89	0.86
Involvement	0.84	0.88	0.86
Recognition	0.83	0.83	0.83
Empowerment system	0.79	0.79	0.79
Process improvement	0.84	0.91	0.87
Education & training	0.83	0.88	0.85
Measurement	0.79	0.84	0.81
Teamwork	0.85	0.89	0.86
Average indices =	0.83	0.87	0.85

6.5.2 Ranking of empowerment activities

Agreement indices (Ag_i) calculated for each of the sixty-two activities were used to rank them in order of importance (i.e. where largest index = highest rank). Subsequently, the mean index of all activities for each respective element (leadership, teamwork, etc.) was calculated to rank the elements (see Table 6.7). Mean agreement index for each elements designated MAg_i. These rankings prioritise the level of attention to be given to each element, and respective activities.

It can be seen from the figure that leadership (MAg_i =0.86) and teamwork (MAg_i =0.85) are considered the most important followed by resources development, involvement, and process improvement (MAg_i =0.84), recognition, and education and training (MAg_i =0.83), then follow with measurement and empowerment system (MAg_i =0.79) achieving least importance.

Figure 6.1. Empowerment activity model



Ranking of activities show facilitation, encouragement, team building, and working conditions as being very critical for the implementation. These activities are mostly tasks of senior management in showing full commitment for and providing necessary resources to the change process. In contrast, from the point of view of employees, highest ranking activities include customer satisfaction, process ownership, reward system and skill development. These activities would indicate that development of employees' skills and subsequent recognition of their achievements elevate their personal efficacy and help take ownership of their processes in delivering high quality service/product to customers.

Further analysis sought to identify any relationship between 'agreement' and 'usage' for each activity, by performing the Spearman Rank Order Correlation test. This test was applied to the two sets of rankings for each element obtained from respective 'agreement' and 'usage' indices (Table 6.7). A significant correlation was found (significance = 0.006, correlation coefficient = 0.783) confirming that respondent companies employ the empowerment activities to the same extent as they perceived them as being important. Table 6.7 shows only the correlation analysis for each of the nine elements based on rankings obtained from mean indices of respective activities attributed to each element. However, correlation between 'agreement' and 'usage' indices calculated for each of the sixty-two activities can be seen in Appendix B (part III), which showed a positive correlation between the industry's perception (agreement) on and usage of the activities for a maximum number of activities. This ensures the validity of the activity model presented in Figure 6.1.

Table 6.7. Rank Order Correlation Between Overall "Agreement" and "Usage" Indices of the Empowerment Elements

Empowerment Element	Measurement Scales			
	Agreement		Usage	
	Indices	Rank	Indices	Rank
(1)	(2)	(3)	(4)	(5)
Leadership	0.86	1	0.66	2*
Teamwork	0.85	2	0.66	3*
Resources development	0.84	3*	0.73	1
Involvement	0.84	4*	0.65	4
Process improvement	0.84	5*	0.62	6
Education and training	0.83	6*	0.57	7*
Recognition	0.83	7*	0.57	8*
Measurement	0.79	8*	0.51	9
Empowerment system	0.79	9*	0.63	5
	Spearman coefficient0.78, significance 0.006			

* Where similar indices pertain, these were ranked by observing percentage of respondents scoring > 3 on the Likert scale.

6.5.3 Analysis by sample sub-groups

The ANOVA (Kruskall-Wallis) test was separately applied to each one of the activities, for several categories of sub-groups of the sample viz.: construction and manufacturing, extent of implementation (1-not at all implemented, 2-implementing 1 to 3 three years, 3-implementing 3 to 5 years, 4-implementing above 5 years), and level of awareness sub groups (1-not at all, 2-little awareness, 3-neutral, 4-awareness, 5-full awareness). The objective was to identify any differences amongst perceptions of the said groups. This result was that significances of probabilities of occurrence under null hypothesis of values as large as the H values (Kruskall-Wallis Coefficients) were greater than the set level of significance, $\alpha = 0.05$ for most of the activities (see Table 6.8). In a crude sense, the observed significance for most of the activities were greater than the set level of

significance (0.05). This means that the null hypothesis (i.e. the research sample come from the same population) should be accepted (Siegel 1956), thus confirming that most of the activities have been rated in a similar manner (strong agreement - see the frequency and relative index analysis) by the sample sub-groups.

Table 6.8. Analysis of variance of empowerment activities by sample sub-groups

Empowerment activities	Significance (Kruskall-Wallis ANOVA)		
	Construction & Manufacturing	Implementatio-n Group	Awareness group
Leadership			
Vision/mission	0.16	0.19	0.08
Management commitment	0.38	0.21	0.03*
Role model	0.66	0.10	0.02*
Champions of empowerment	0.26	0.80	0.26
Executives walkthroughs	0.98	0.74	0.80
Encouragement	0.68	0.02*	0.34
Facilitation	0.09	0.00*	0.10
Resources development			
Organisational restructuring	0.45	0.22	0.46
Working conditions	0.50	0.64	0.51
Funding	0.09	0.18	0.78
Involvement			
Employee involvement	0.02*	0.41	0.29
Customer (external) involvement	0.05*	0.80	0.34
Supplier (external) involvement	0.18	0.33	0.58
Voluntary participation	0.12	0.23	0.57
Grievances filing	0.15	0.13	0.36
Employee satisfaction	0.08	0.21	0.45
Customer satisfaction	0.70	0.25	0.37
Recognition			
Reward system	0.96	0.34	0.10
Award ceremony	0.92	0.75	0.23
Presentations	0.34	0.65	0.49
Empowerment system			
Empowerment system	0.77	0.97	0.99
Quality policy	0.25	0.44	0.88
Procedures	0.52	0.28	0.19
Roles of employees	0.90	0.43	0.40
Empowerment implementation plan	0.82	0.56	0.72
Process improvement			
Problem solving	0.00*	0.02*	0.20
Joint labour/management problem solving	0.27	0.08	0.33
Department improvement plan	0.30	0.00*	0.15
Jobsite (plant) improvement plans	0.87	0.10	0.14
Statistical process control	0.00*	0.06	0.56
Process evaluation	0.04*	0.09	0.30
Process ownership	0.37	0.01*	0.03*
Quality function deployment	0.00*	0.12	0.40

Table 6.8 contd.

Lowered levels of decision making	0.12	0.07	0.24
Two-way communications	0.12	0.08	0.04*
Education and training			
Training	0.01*	0.05	0.85
Skill development	0.02*	0.32	0.57
Skill certification	0.16	0.01*	0.41
Display boards	0.12	0.19	0.72
Posters	0.34	0.57	0.56
Technical cross-training	0.03*	0.14	0.78
Empowerment awareness	0.83	0.17	0.36
News letters	0.96	0.17	0.12
Supplier training	0.32	0.62	0.07
Self-managing training	0.75	0.13	0.88
Measurement			
Job performance evaluation	0.45	0.95	0.25
Benchmarking	0.21	0.12	0.03*
Self-assessment of performance	0.49	0.06	0.61
Diagnostic survey	0.30	0.13	0.74
Documentation	0.25	0.00*	0.68
Inspection	0.35	0.01*	0.27
Sampling	0.11	0.44	0.32
Teamwork			
Team meetings	0.61	0.03*	0.48
Self-directed work teams	0.01*	0.17	0.75
Co-ordination	0.63	0.18	0.49
Team buildings	0.13	0.03*	0.21
Advisory committees	0.72	0.71	0.97
Group decision making	0.23	0.02	0.26
Conflict resolution	0.41	0.66	0.57
Cross-functional teams	0.39	0.01*	0.19
Quality improvement teams	0.26	0.03*	0.43
Goal setting	0.06	0.16	0.26

Legend:
Implementation group: 1 - Not at all implemented; 2 - 1 to 3 years in implementation; 3 - 3 to 5 years in implementation; and 4 - above 5 years in implementation.
Awareness group: 1 - no awareness on empowerment; 2 - little awareness; 3 - some awareness; 4 - Awareness; and 5 - Full awareness
* - Difference at 0.05 level of significance

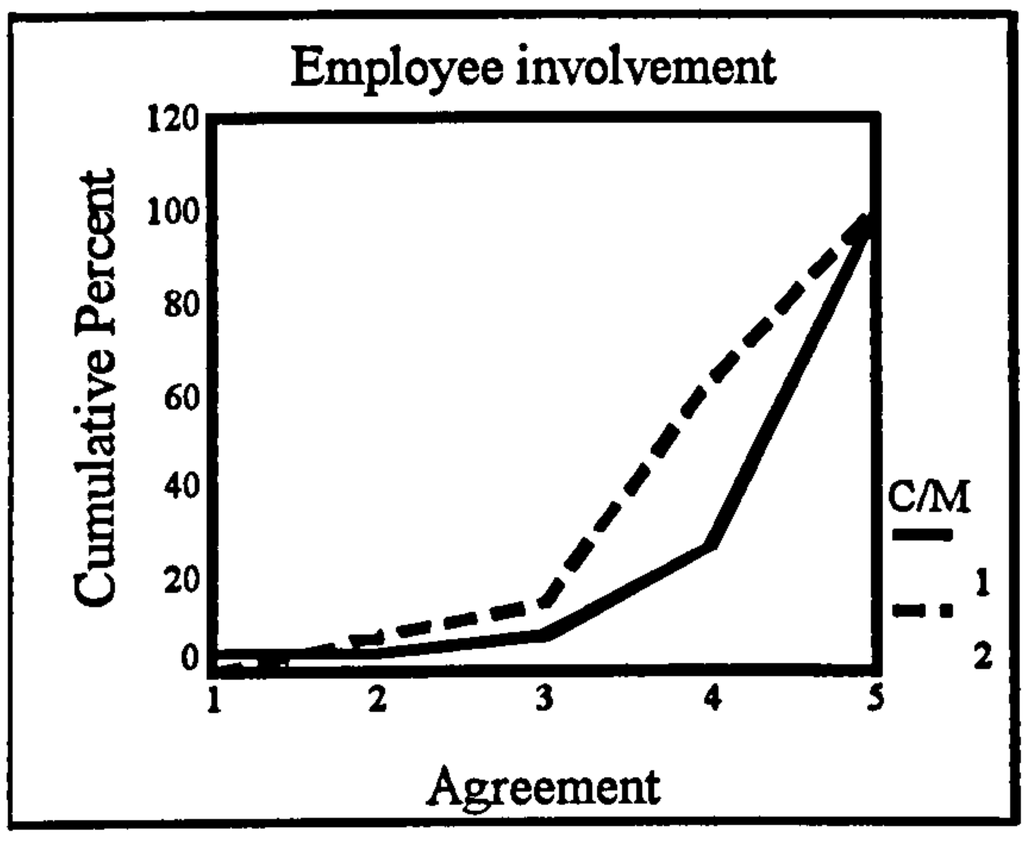
It can be seen from Table 6.8 that some activities differ in perceptions (of importance) by groups. For instance, construction and manufacturing groups differ on nine out of sixty-two activities: employee involvement; customer involvement; problem solving; statistical process control; process evaluation; quality function deployment; training; skill development; technical cross-training; and self-directed work teams. Further

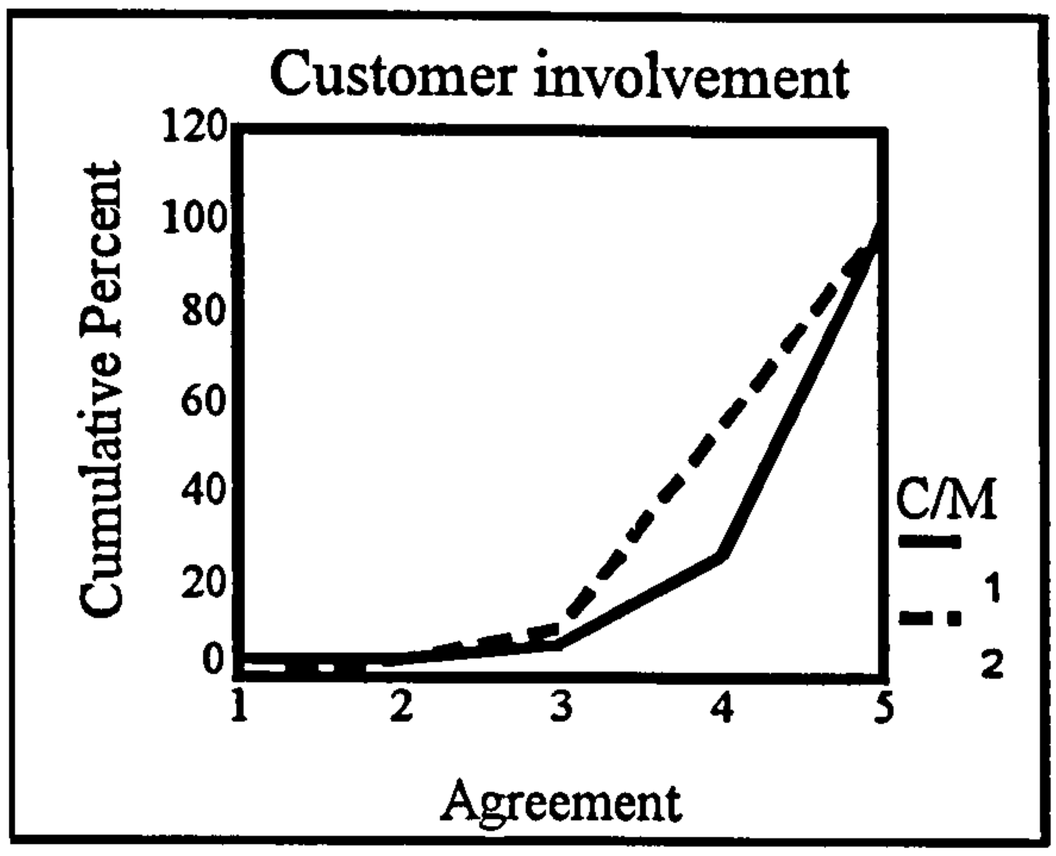
investigations were performed on those particular activities on which the sub-groups differed in their perceptions.

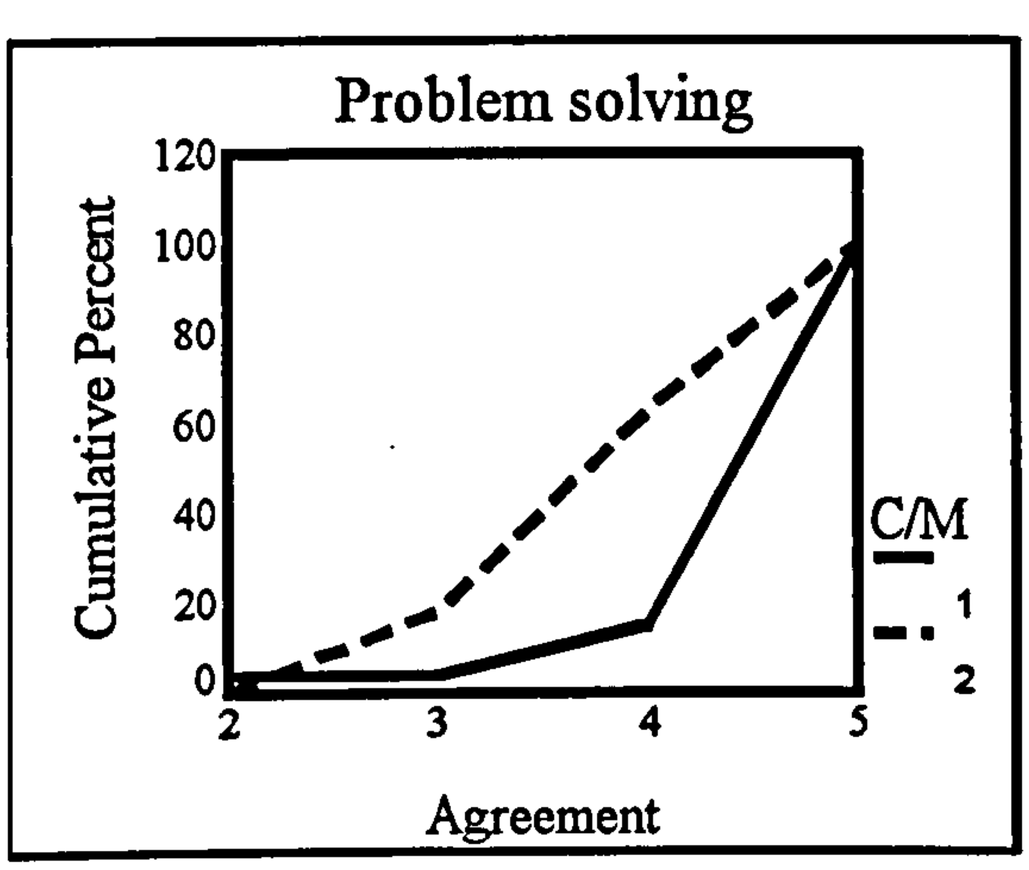
Approximately, 10 out of the 62 activities exhibited differences in (importance) ratings by sub-groups; mainly in the areas of involvement, process improvement, education and training, and teamwork. In order to explore the pattern and degree of these differences, cumulative distribution curves were drawn for responses to each activity. Results show that the manufacturing sample agreed more strongly with the said activities as important than the construction sector. However, both construction and manufacturing are within the 'strong' agreement region, i.e. exhibit agreement indices > 0.80 (e.g. Figure 6.2). The higher levels of agreement amongst the manufacturing rating may be because the activities were originally derived from their sector's experiences. Another reason may be that activities like self-directed work teams and statistical process control are largely applied in manufacturing sector, because of its permanent workforce and repetitive nature. Construction tends to lack these characteristics so it seems logical construction respondents show little interests in these activities.

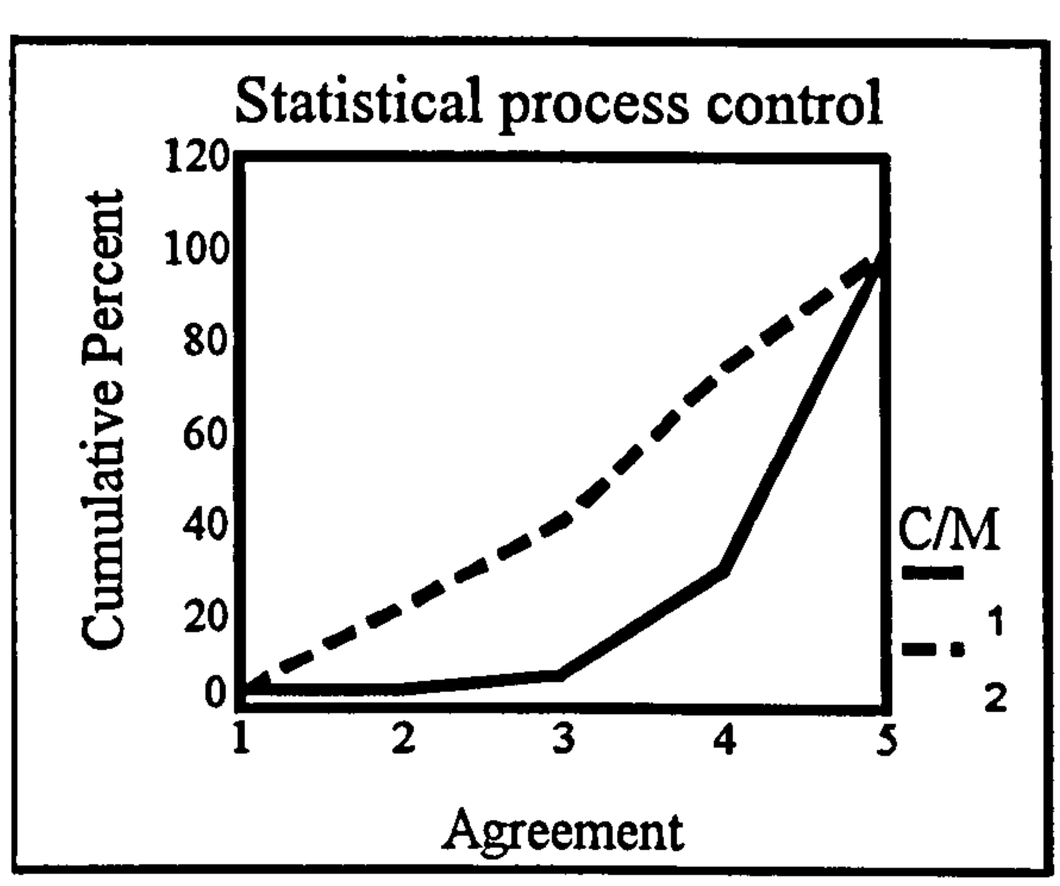
The ANOVA among groups of implementators (1-not at all implemented, 2-implementing 1 to 3 three years, 3-implementing 3 to 5 years, 4-implementing above 5 years) showed that those with greatest experience of implementing empowerment agreed more strongly with the activities than those who were less experienced, or had not implemented empowerment (e.g. Figure 6.3). Also, the analysis amongst groups of 'awareness on empowerment' (1-not at all, 2-little awareness, 3-neutral, 4-awareness, 5-full awareness) indicated that those who are fully aware of the concept agreed more strongly than those who were less aware of the concept (e.g. Figure 6.4). In essence, those who are highly knowledgeable on, and experienced with, empowerment have

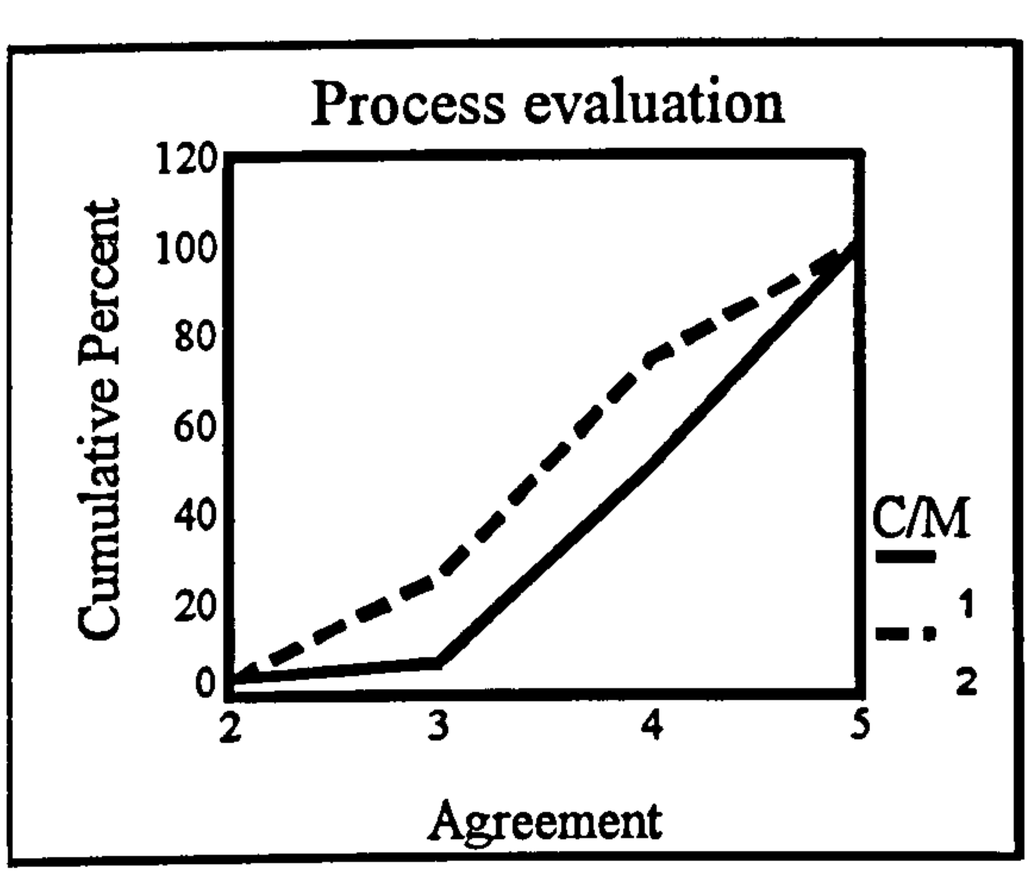
Figure 6.2. Analysis of variance of empowerment activities by construction and manufacturing

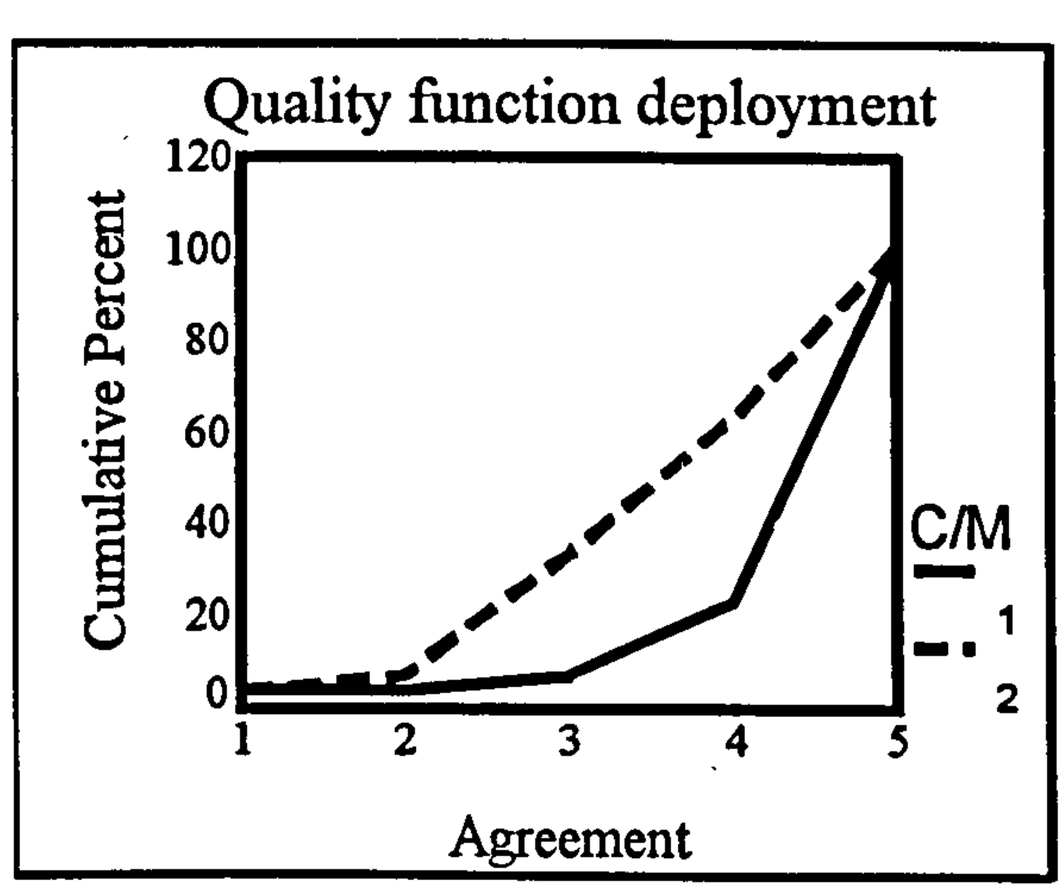






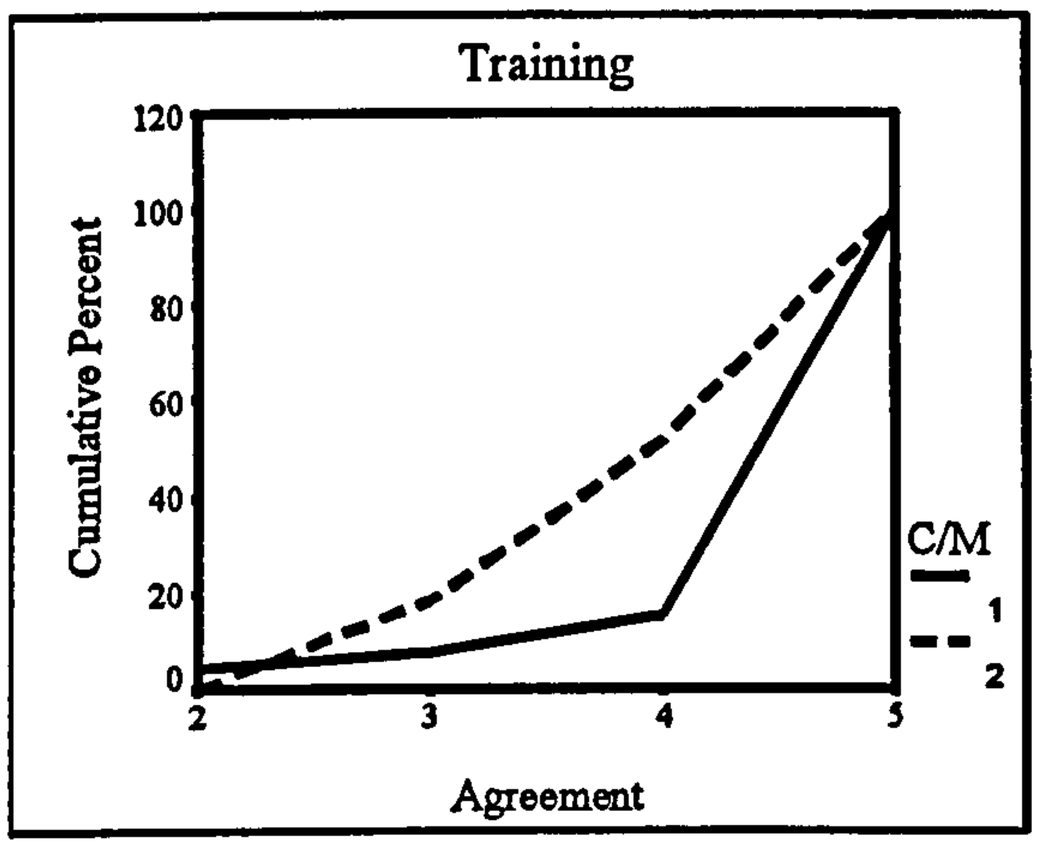


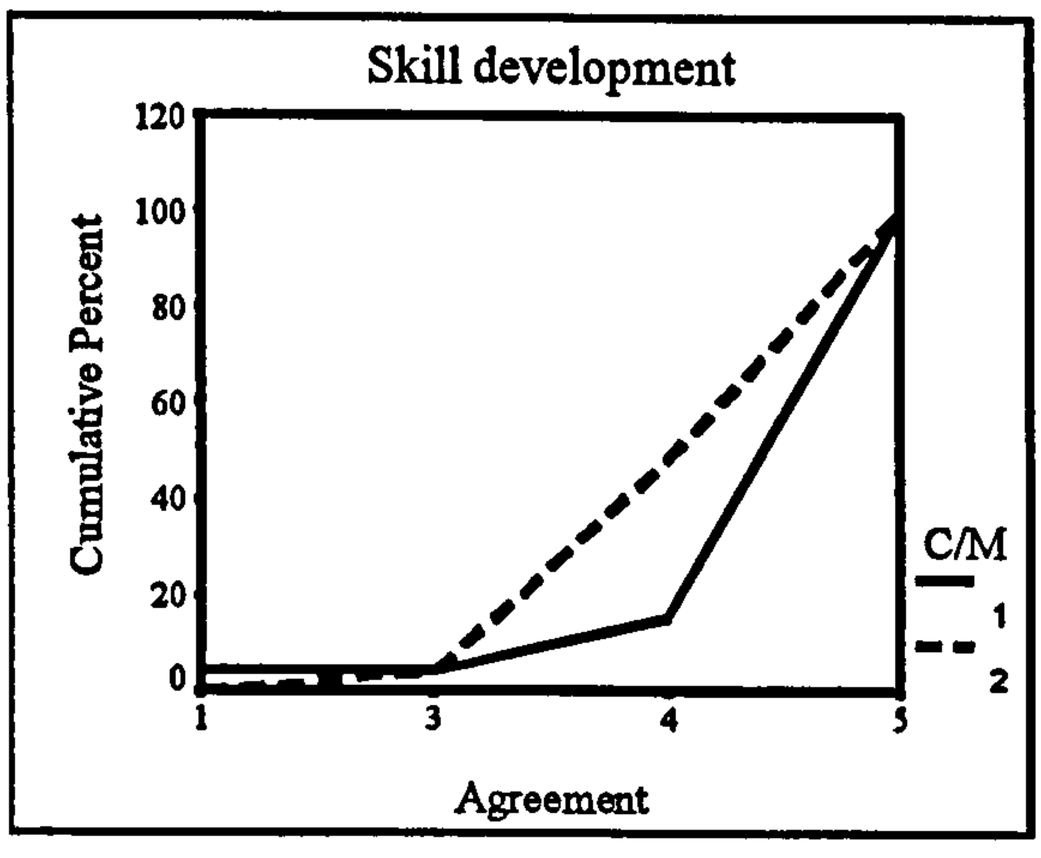


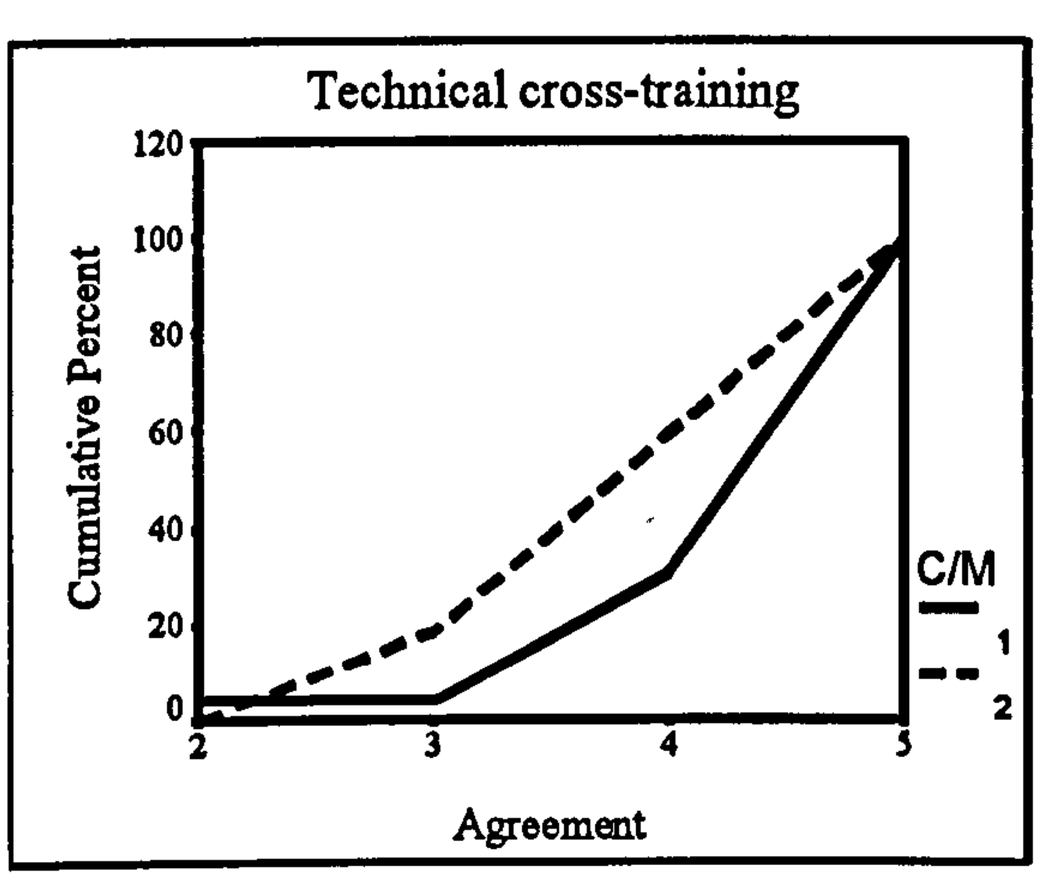


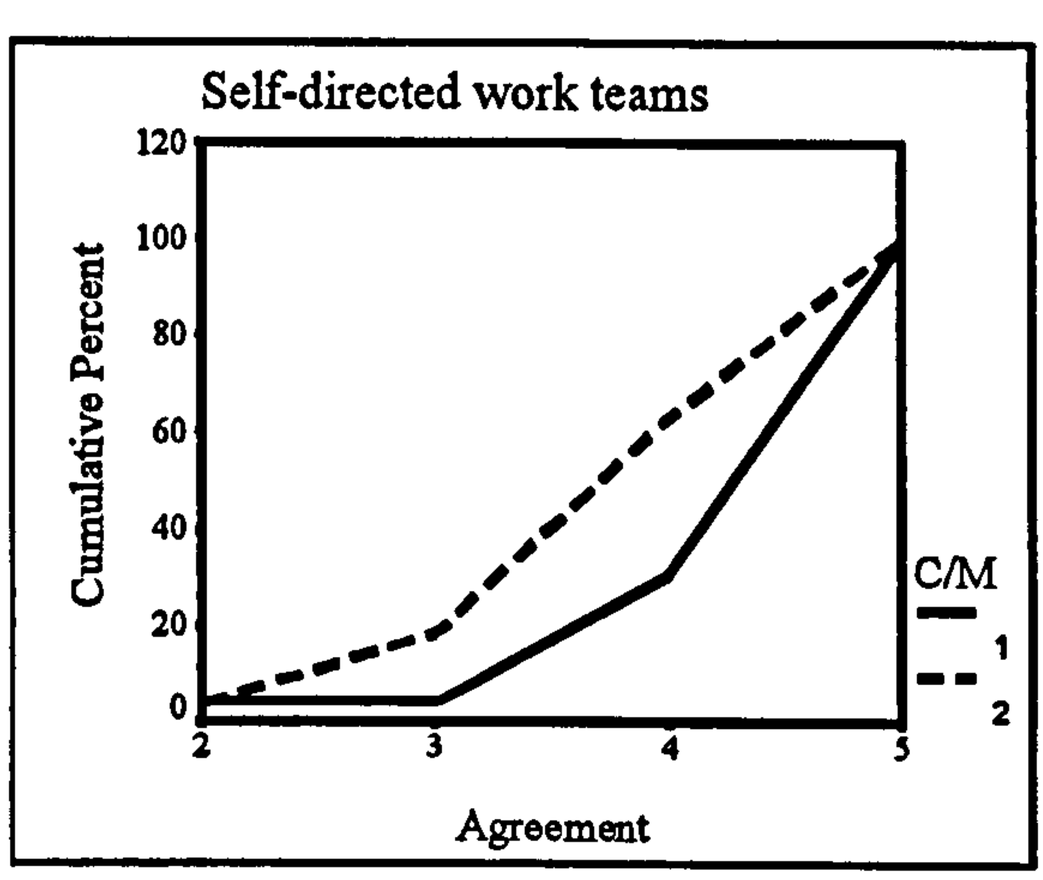
Legend:
C/M - Construction/Manufacturing
Line1 - Manufacturing
Line2 - Construction
Agreement
1 - strongly disagree; 2 - disagree; 3 - neutral; 4 - agree; 5 - strongly agree

Figure 6.2. Analysis of variance of empowerment activities by construction and manufacturing (contd.)



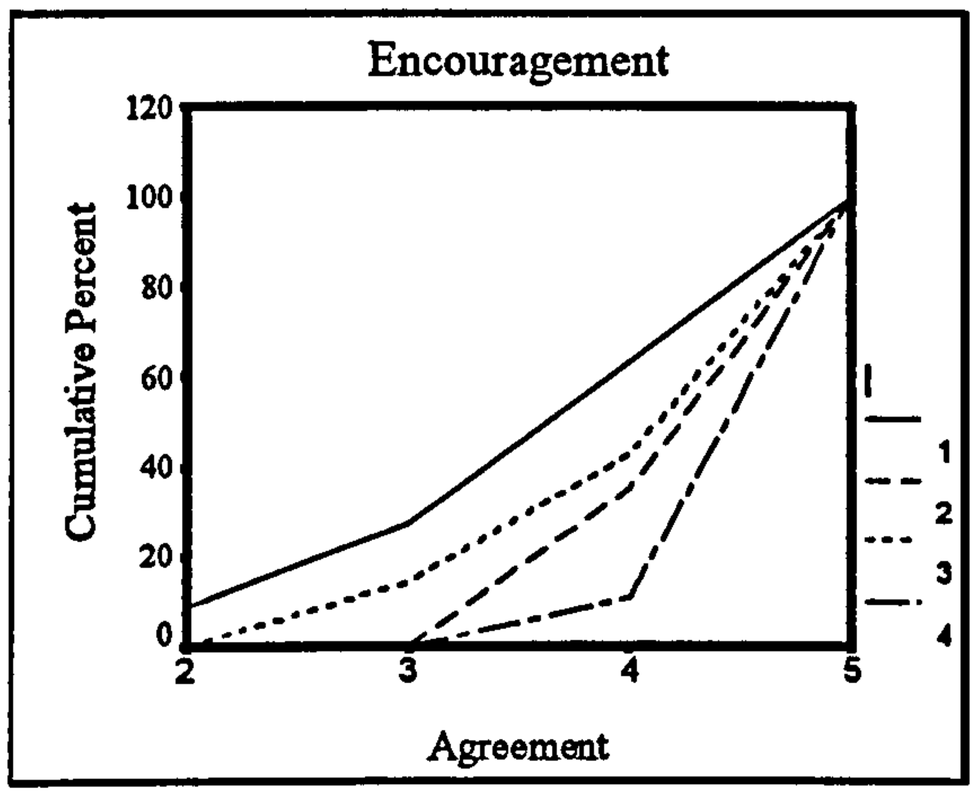


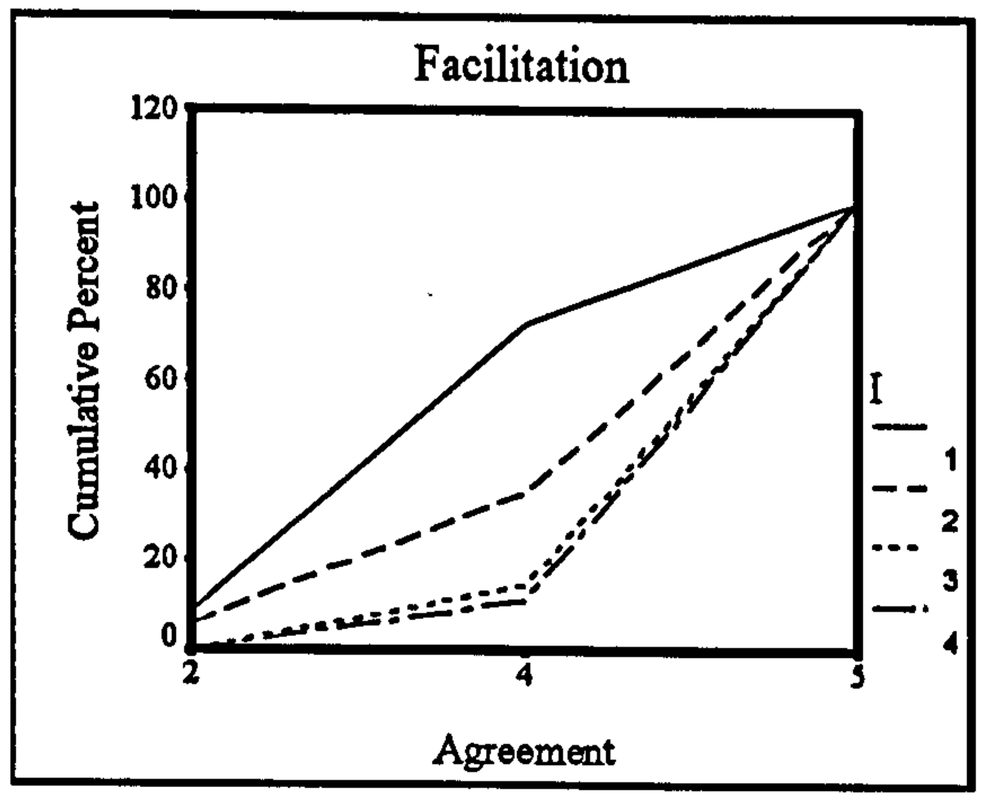


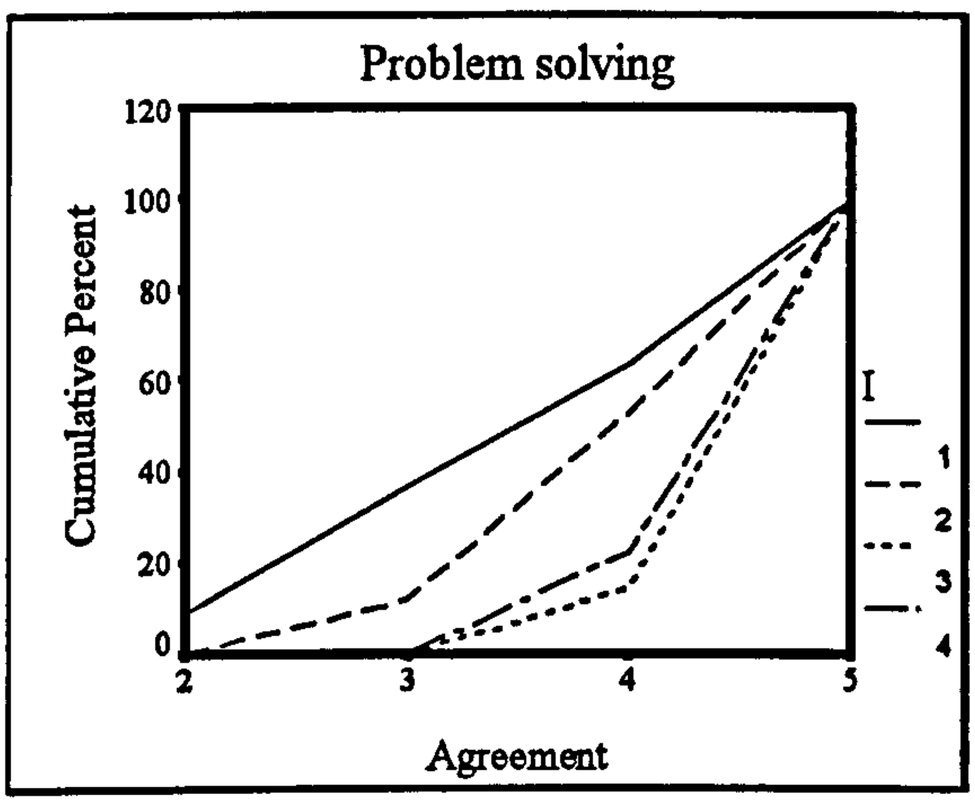


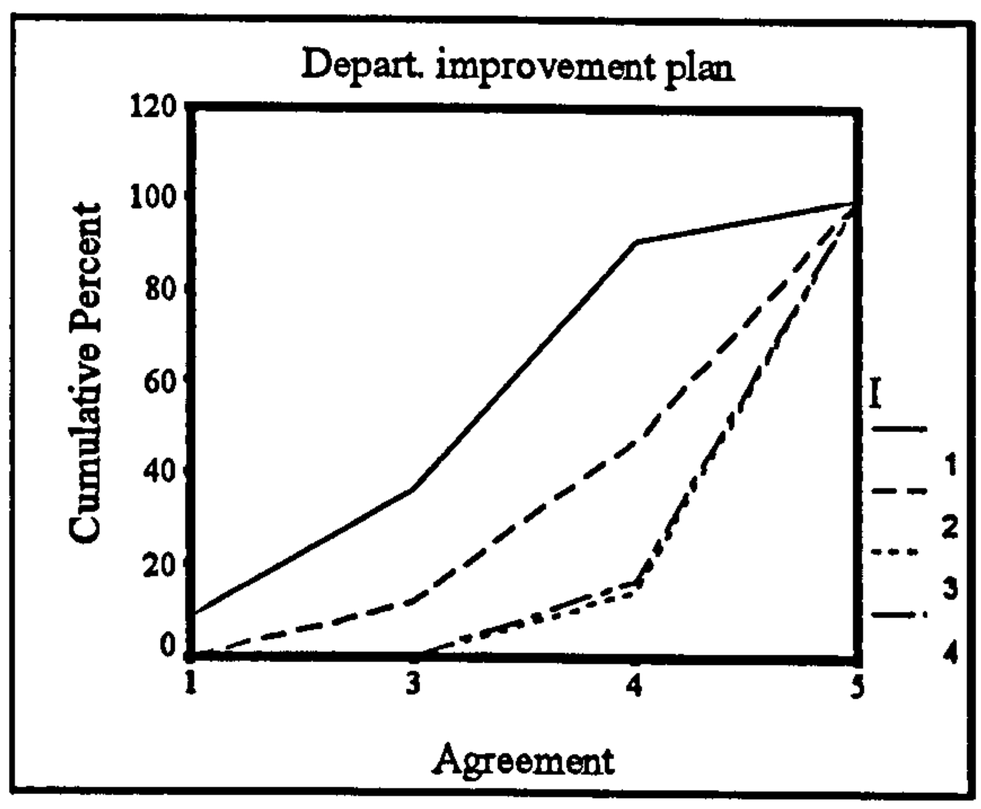
Legend:
C/M - Construction/Manufacturing
Line1 - Manufacturing
Line2 - Construction
Agreement
1 - strongly disagree; 2 - disagree; 3 - neutral; 4 - agree; 5 - strongly agree

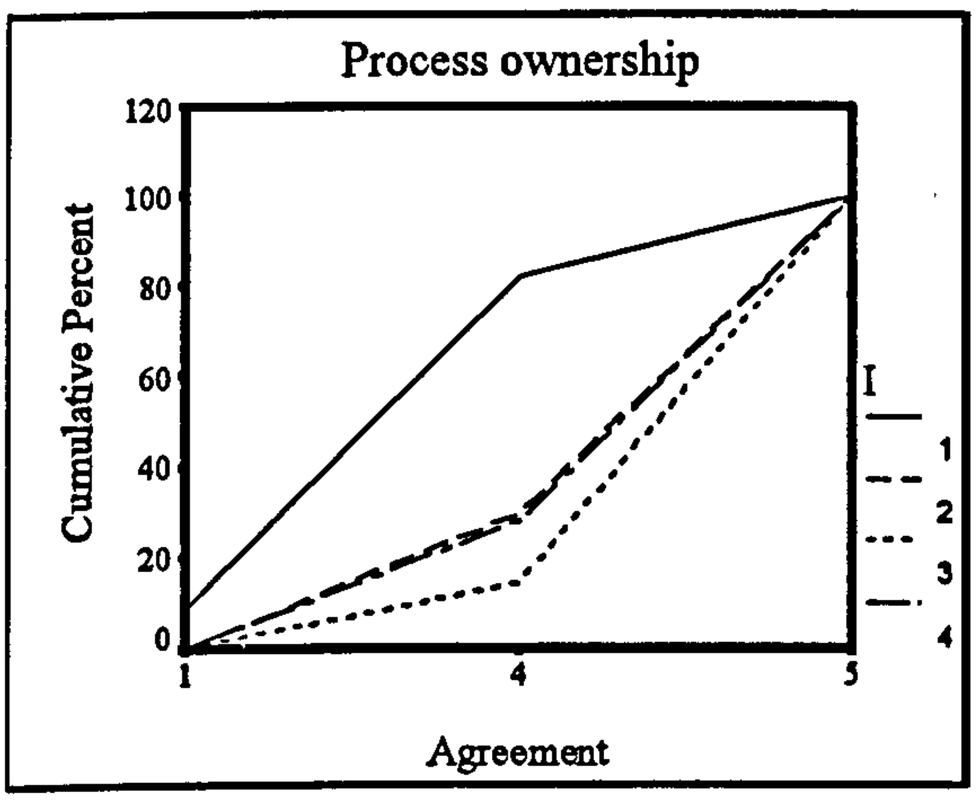
Figure 6.3. Analysis of variance of empowerment activities by Implementation Group

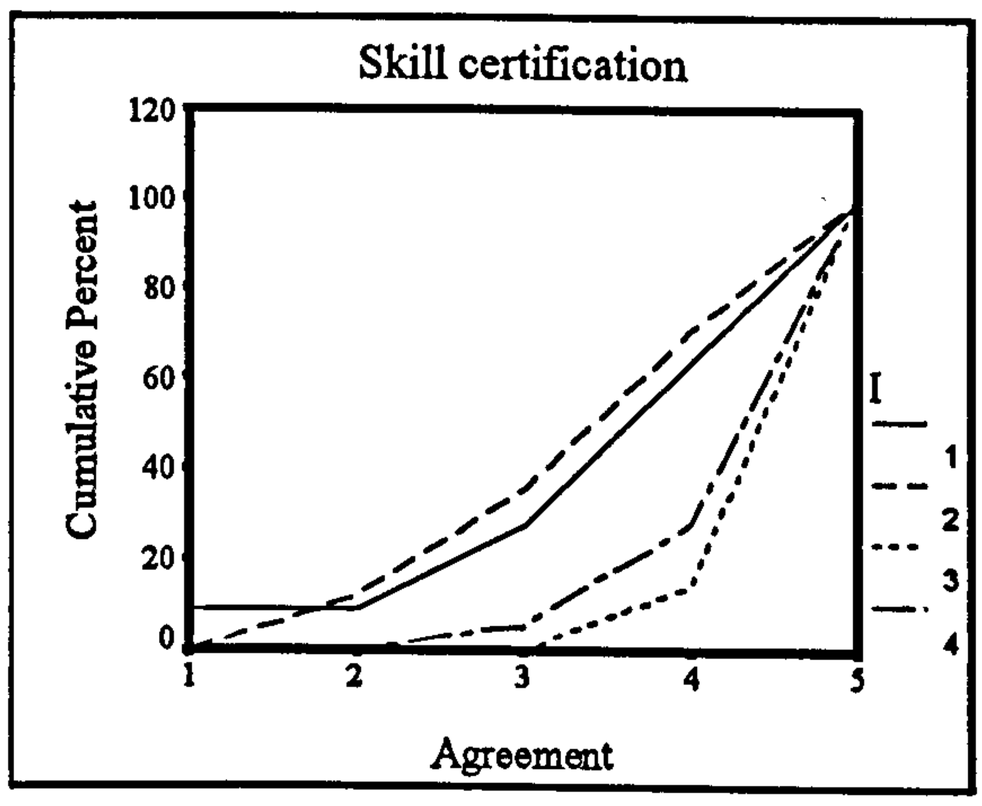






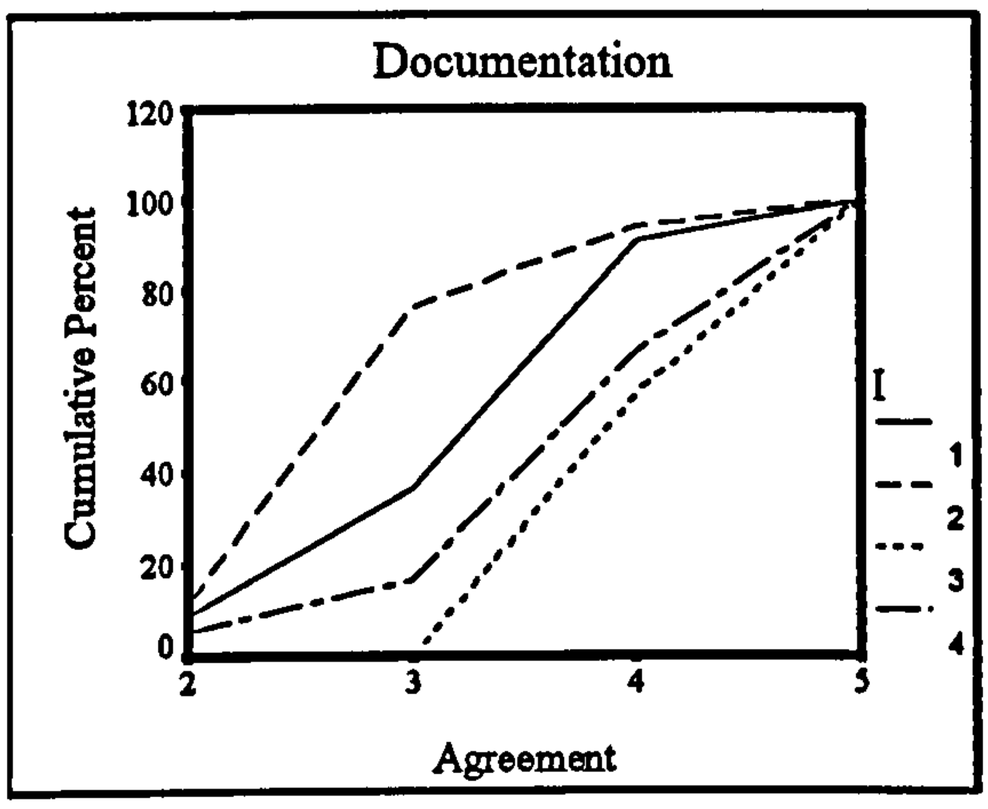


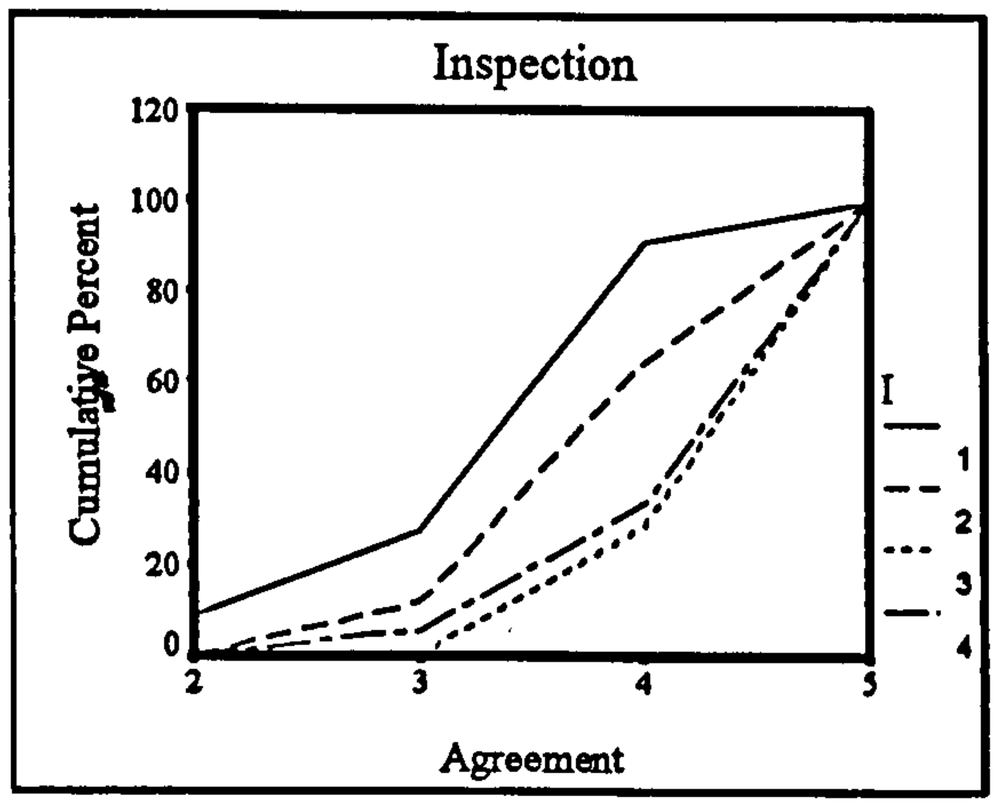


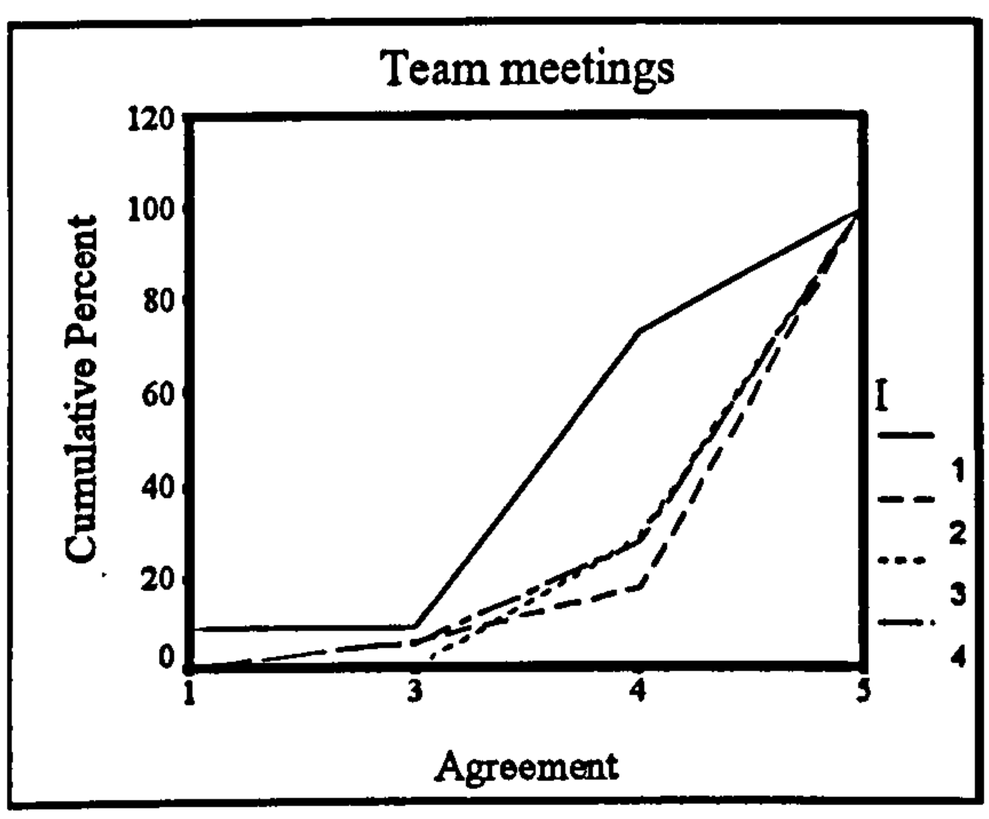


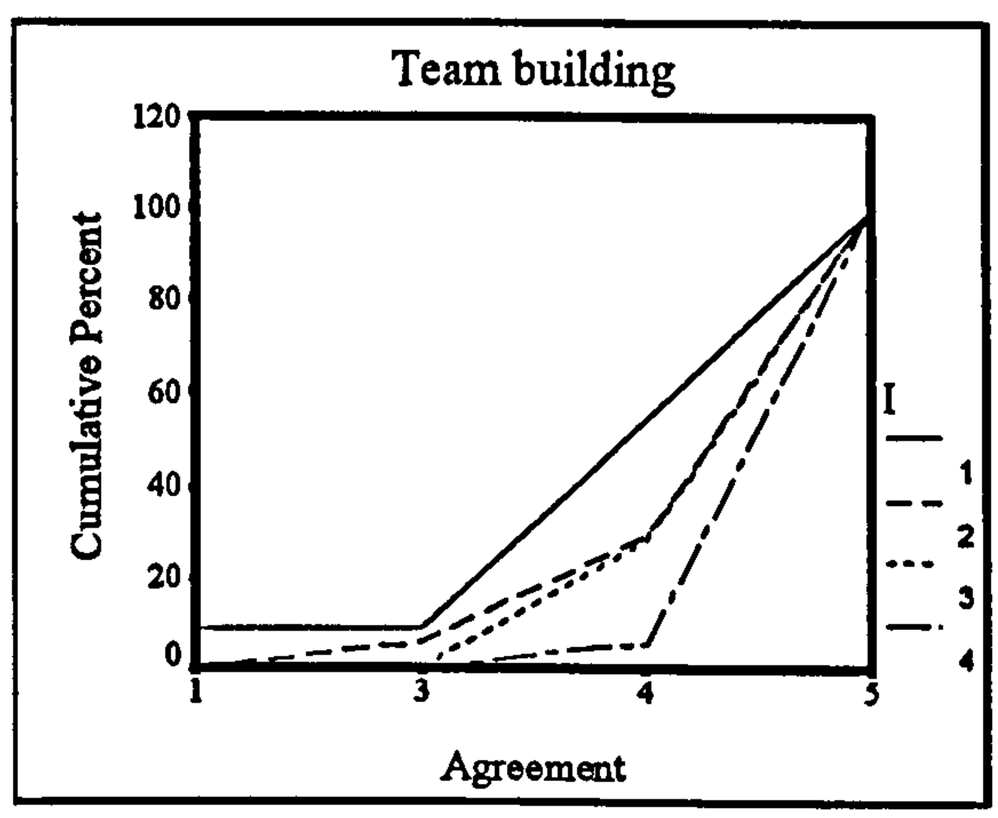
Legend:
I - Implementation Lines
1 - Not at all; 2 - 1 to 3 years; 3 - 3 to 5 years; 4 - above 5 years
Agreement
1 - strongly disagree; 2 - disagree; 3 - neutral; 4 - agree; 5 - strongly agree

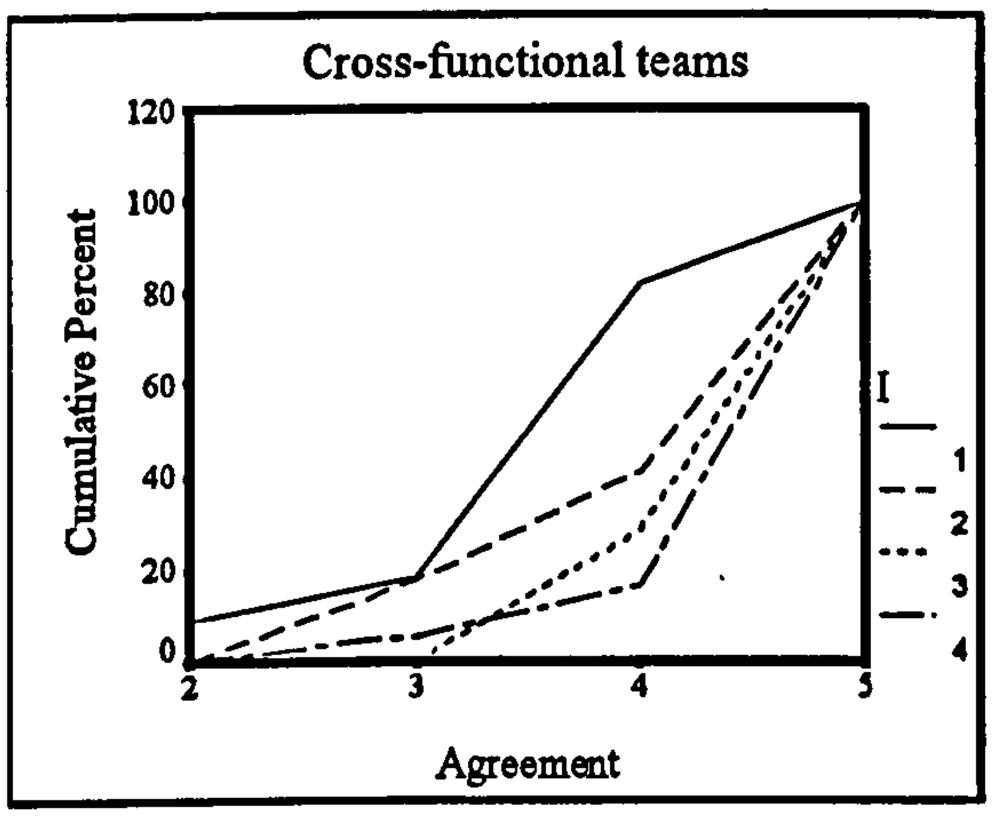
Figure 6.3. Analysis of variance of empowerment activities by Implementation Group (contd.)

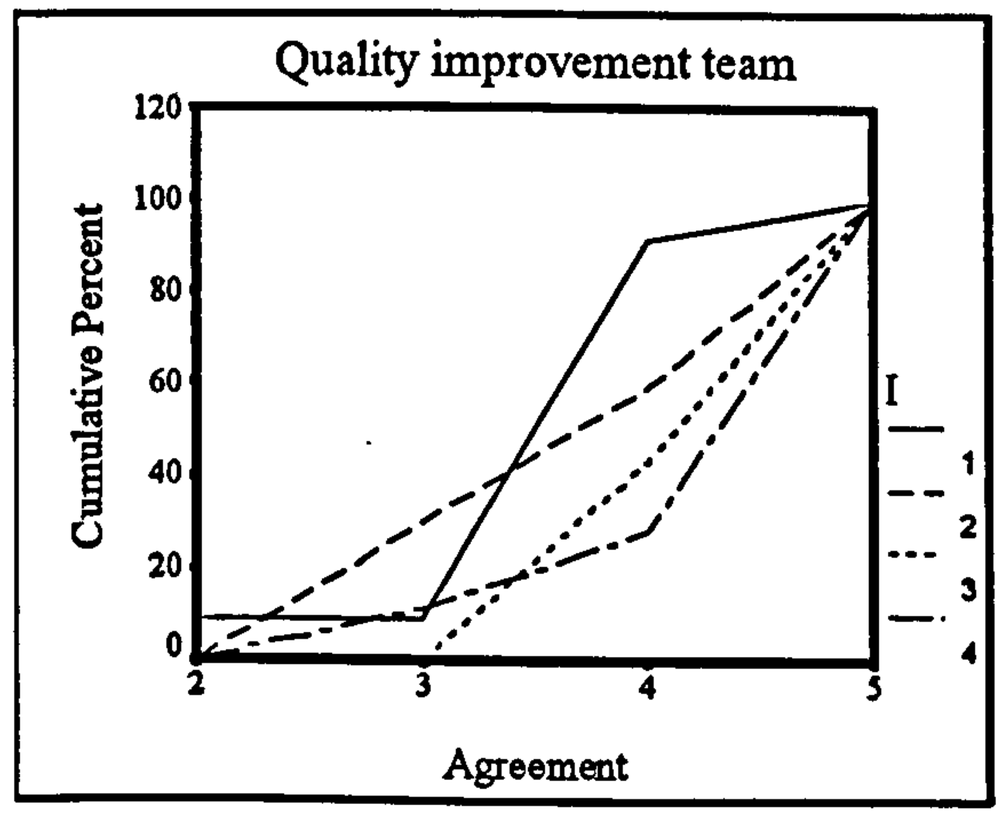






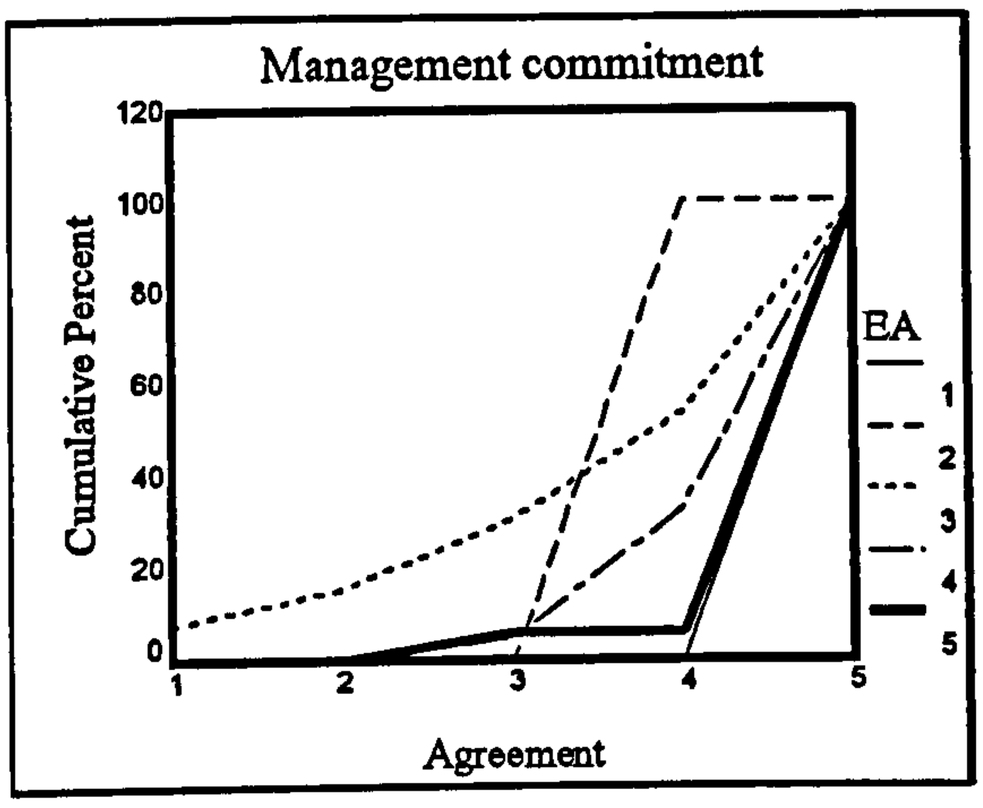


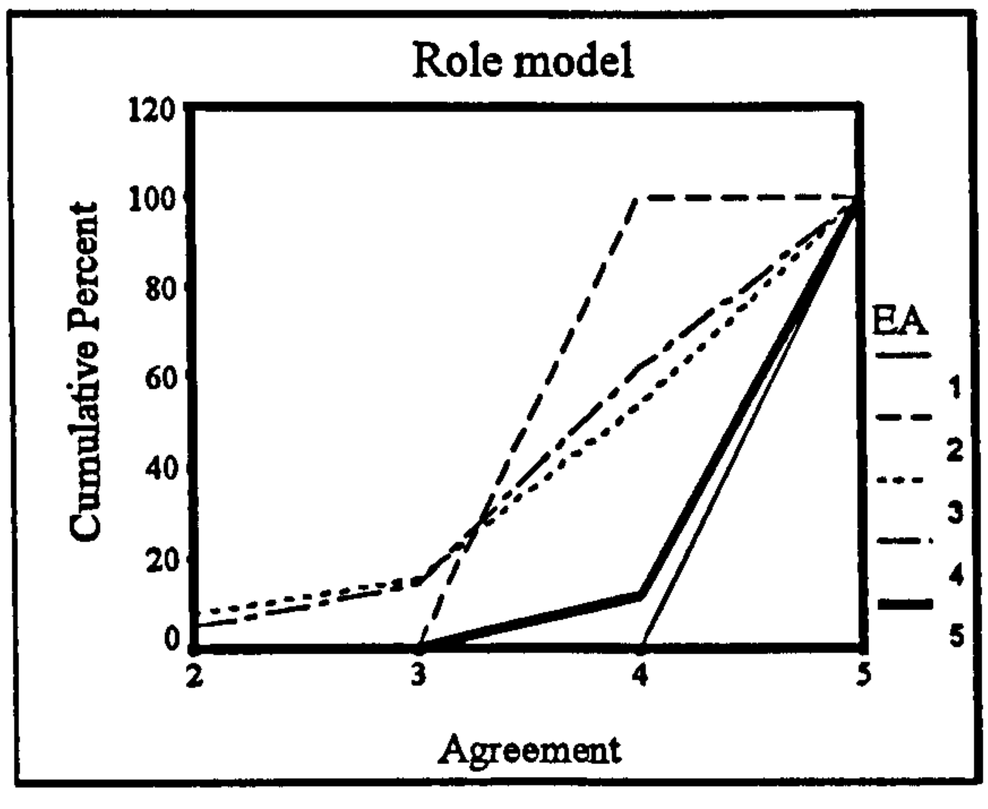


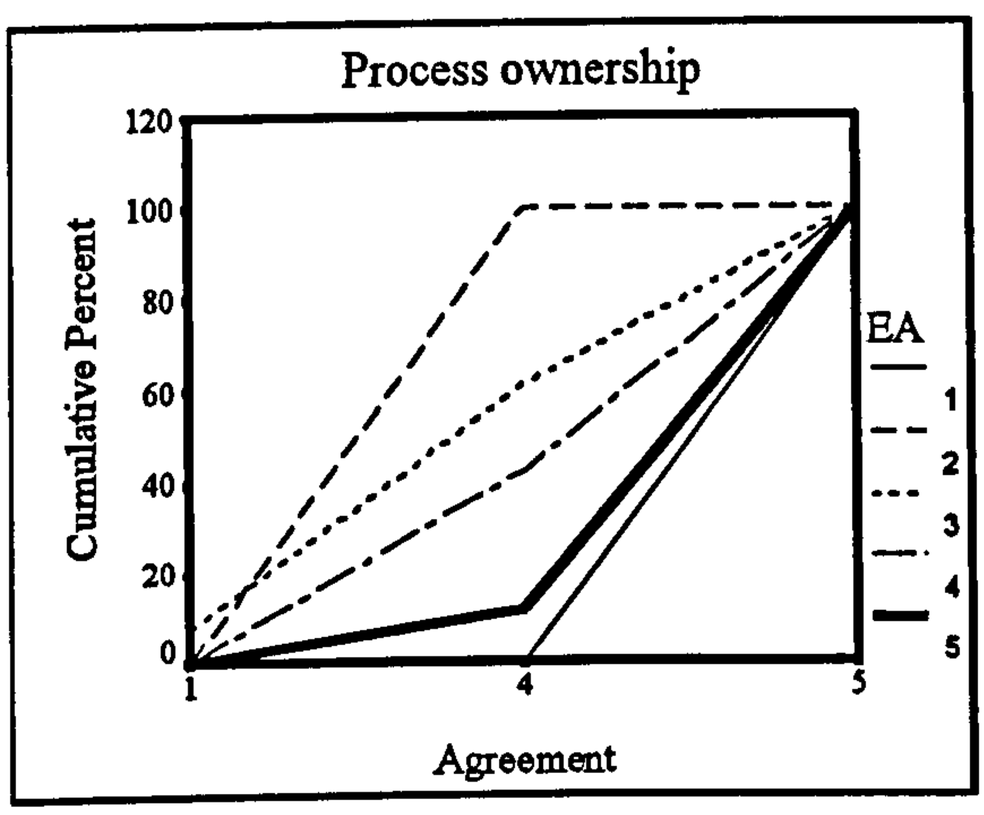


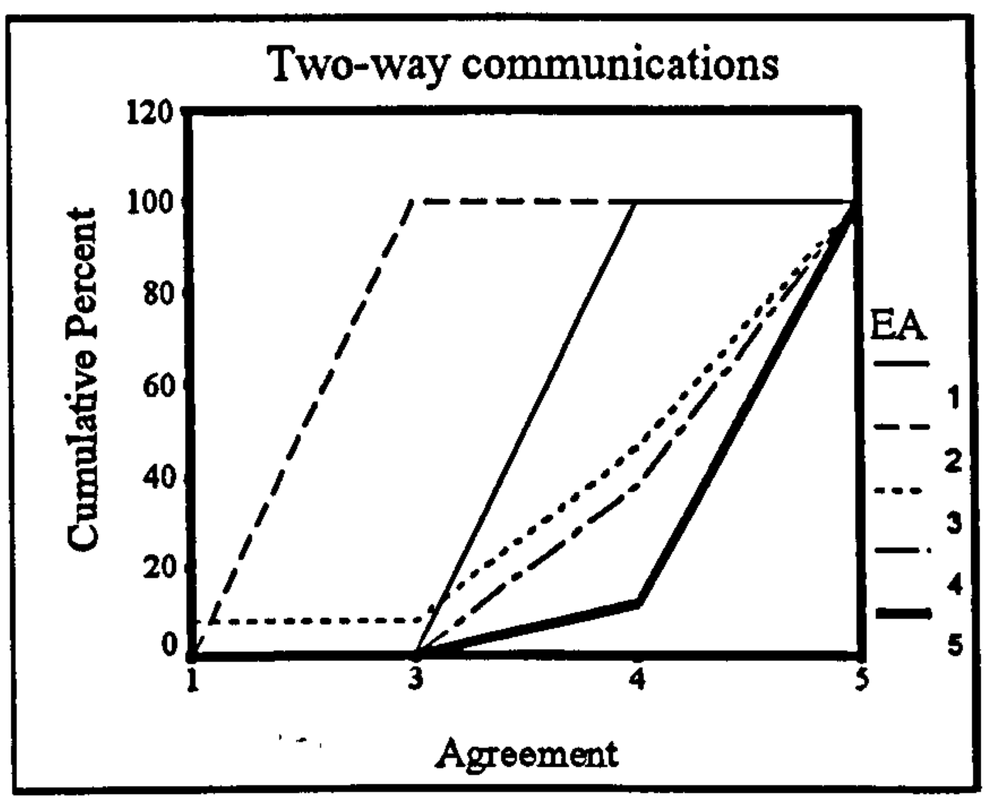
Legend:
I - Implementation Lines
1 - Not at all; 2 - 1 to 3 years; 3 - 3 to 5 years; 4 - above 5 years
Agreement
1 - strongly disagree; 2 - disagree; 3 - neutral; 4 - agree; 5 - strongly agree

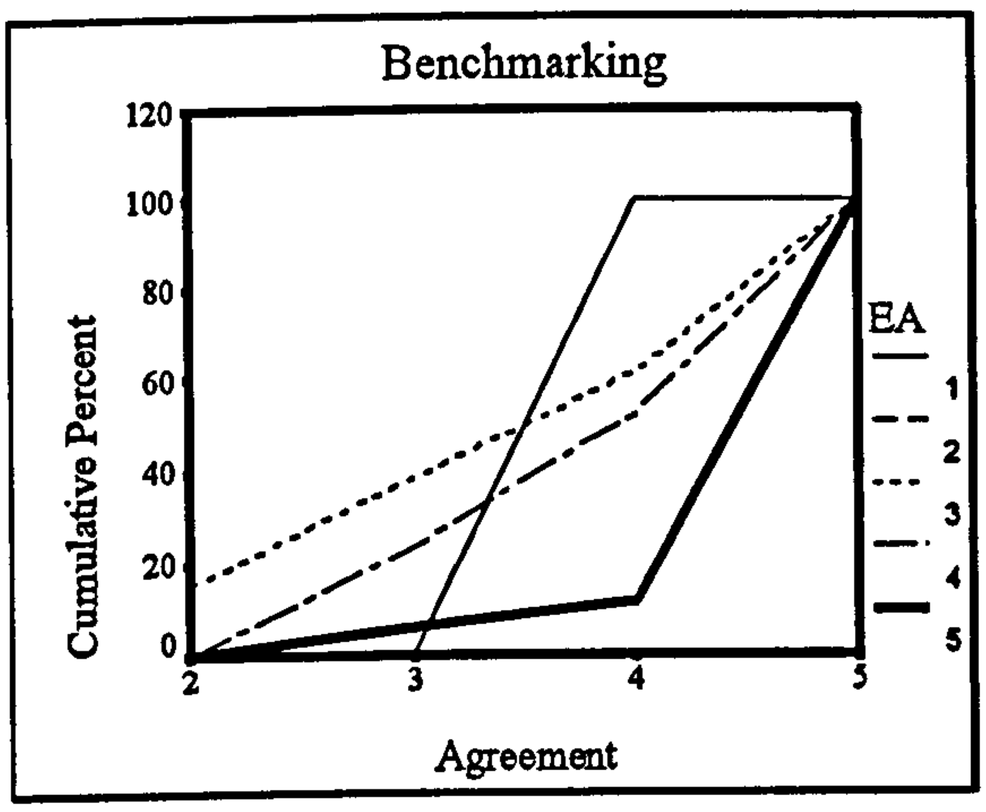
Figure 6.4. Analysis of variance of empowerment activities by Empowerment Awareness Group











Legend:
EA - Awareness Lines
1 - Not at all; 2 - little awreness; 3 - neutral; 4 - awareness; 5 - Full awareness
Agreement
1 - strongly disagree; 2 - disagree; 3 - neutral; 4 - agree; 5 - strongly agree

confirmed the activities presented in the survey as being very important for effective implementation of the concept of empowerment.

6.5.4 Usage of empowerment activities

To observe current involvement of both the construction and manufacturing sectors regarding the said activities, data obtained by the 'usage' scale (see section 6.3 for the scale) was analysed using, all of the tests conducted on 'agreement' data (frequency analysis, relative indices, ANOVA, cumulative distribution curves, and cumulative distribution percentiles). The main objectives here were to: observe current perceptions and extent of usage of the activities by industry, (to validate the feasibility of their practical existence); highlight the significant involvement of four levels of an organisation in performing the activities, (to assist empowerment implementators in producing appropriate strategies); and develop an EIP (Empowerment Implementation Profile) model for measuring empowerment implementation.

With respect to usage of activities, the questionnaire was designed to assess the sixty two activities in two different dimensions. Dimension 1 investigated the extent of each activity *usage* within respondent organisations. Dimension 2 explored the level of *involvement* of empowered employees at four organisational levels (strategic, general, operational, and direct work). Against each one of the sixty-two activities the extent to which they were being used was measured using the 'usage' scale. Level of involvement was measured against each of four levels of an organisation (strategic, general, operational, and direct work). It is important to note here that under dimension 2, involvement was measured with regard to each of the nine major empowerment elements (leadership, resources development, involvement, recognition, empowerment system, process improvement,

education and training, measurement and teamwork). That is, the latter scale measured degree of employee involvement in performing the nine elements.

Current usage of empowerment activities

Frequency analysis performed upon the *agreement* data indicated that, on average, more than 80% of respondents perceived every empowerment activity as being critical for successful implementation. However, frequency analysis performed upon the *usage* data indicated that, on average, only 39% of respondents used all empowerment activities to a full extent in their organisation. Percentage frequency for each of the sixty-two activities can be seen in Appendix B (part II). It can be seen that senior management activities like encouragement, funding, working conditions, and team building, and employees activities like process ownership, skill development, problem solving are more highly used than other activities. This concurrs with the importance rankings of activities as depicted in the activity model (Figure 6.1). Thus, there is concordance between respondents' overall ratings of *importance* of activities and degree of *usage* in their organisations. In addition, the usage indices calculated for all of the activities showed a similar pattern to that of frequency analysis (of usage data), with indices ranging between 0.50 and 0.71 (Table 6.9). This table shows only mean scores of groups of activities attributed to each of the elements (i.e. MAg_i). Indices for each of the sixty-two activities are exhibited in Appendix B (part II). In essence, the results of both frequency and indices analysis confirm that the activities are being used in both construction and manufacturing to a considerable extent.

Comparison of the relative usage indices between construction and manufacturing showed that construction is equally as receptive to manufacturing, in using the activities (see Part II in Appendix B). However, it is clear that manufacturing is ahead in using the activities to slightly a larger extent than construction. In order to explore the degree of difference among experienced and inexperienced users with respect to empowerment, further

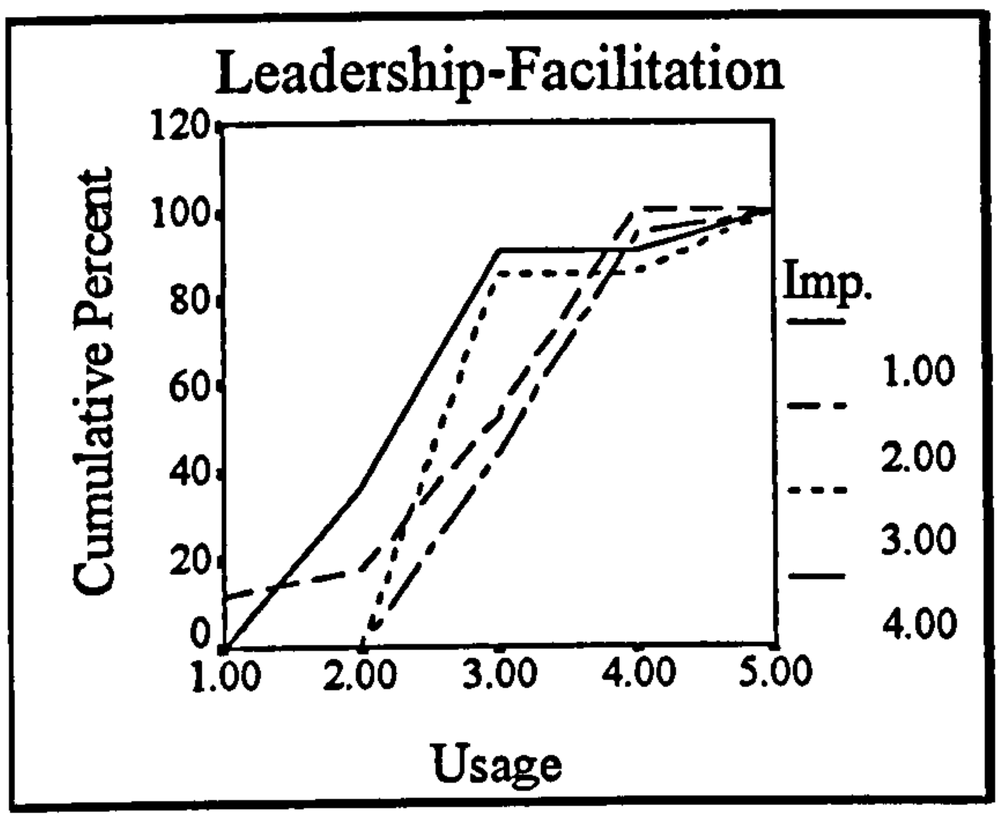
investigation was performed by analysing the data in terms of four groups of implementators. The groups were: 1-not at all implemented, 2-having implemented for one to three years, 3- having implemented for three to five years, 4-having implemented for above five years. Cumulative distribution curves were established for each activity. Example curves are presented in Figure 6.5. Analysis of figure 6.5 shows that organisations with greatest experience of empowerment have used more activities to a larger extent than those who were less experienced, or had not implemented empowerment. This is of course logical and to a certain extent expected.

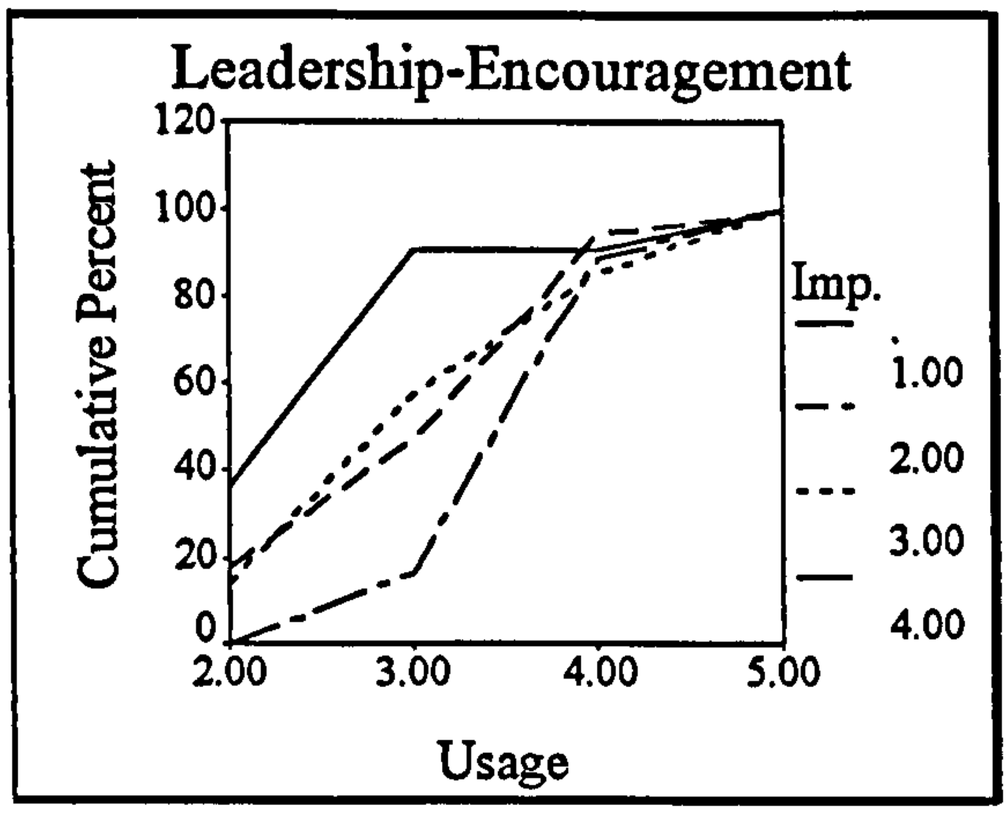
Table 6.9. Empowerment activities - relative usage indices

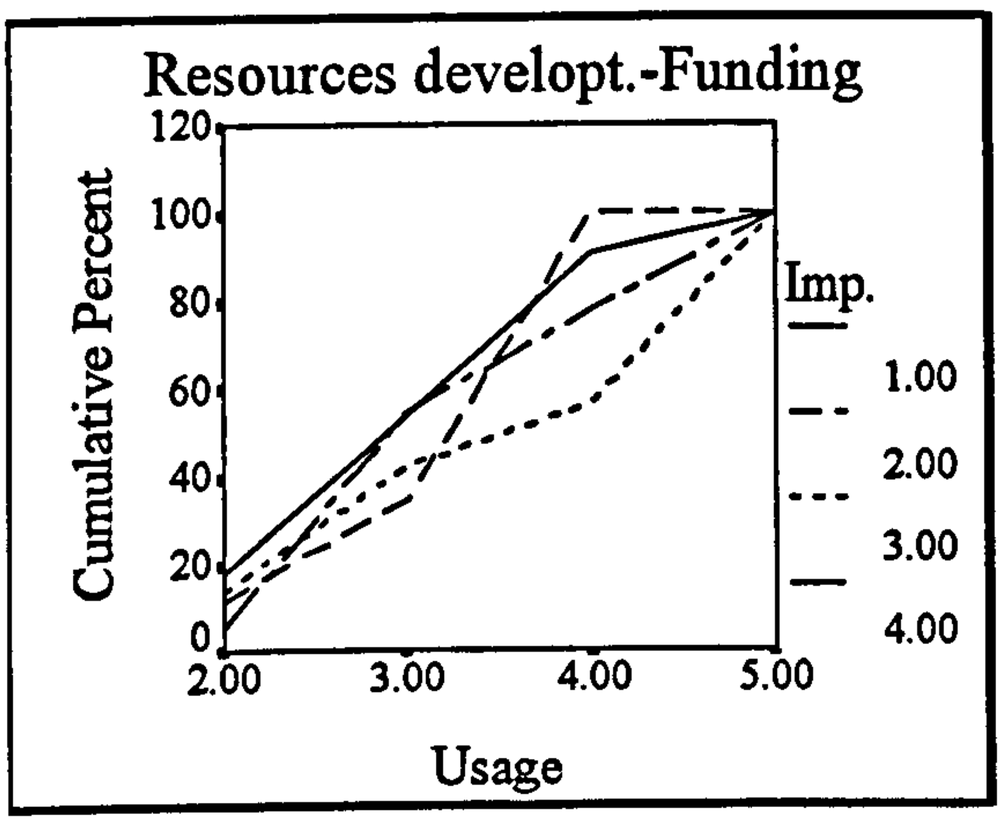
Activity	Construction	Manufacturing	Total sample
Leadership	0.63	0.67	0.65
Resources development	0.70	0.71	0.71
Involvement	0.63	0.70	0.66
Recognition	0.56	0.64	0.60
Empowerment system	0.61	0.61	0.61
Process improvement	0.57	0.69	0.63
Education and training	0.55	0.67	0.61
Measurement	0.50	0.58	0.53
Teamwork	0.59	0.63	0.61
Mean indices	0.59	0.65	0.62

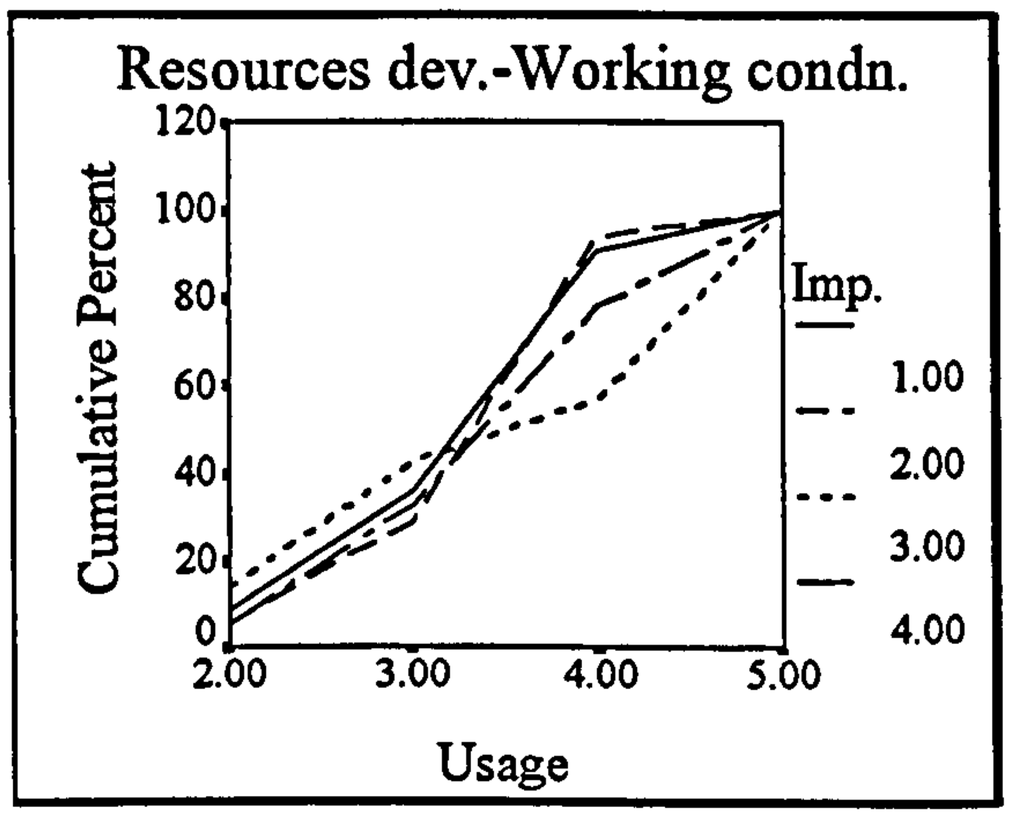
Index scale = 0.2 to 1.0 where largest index = greatest usage.

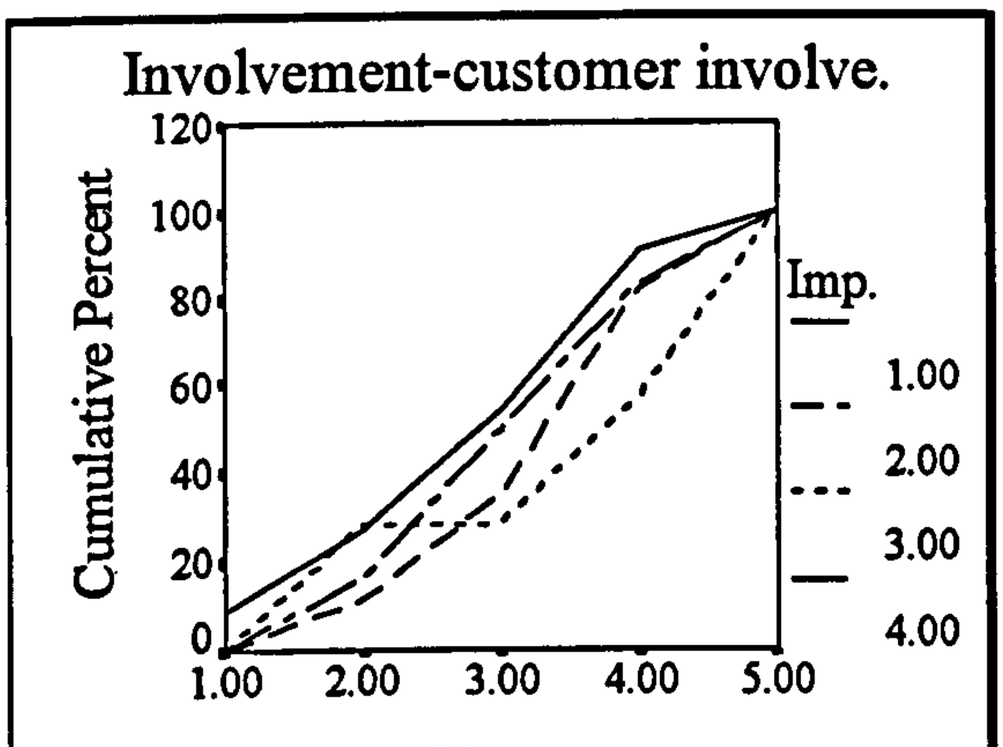
Figure 6.5. Current usage of empowerment activities by implementation groups

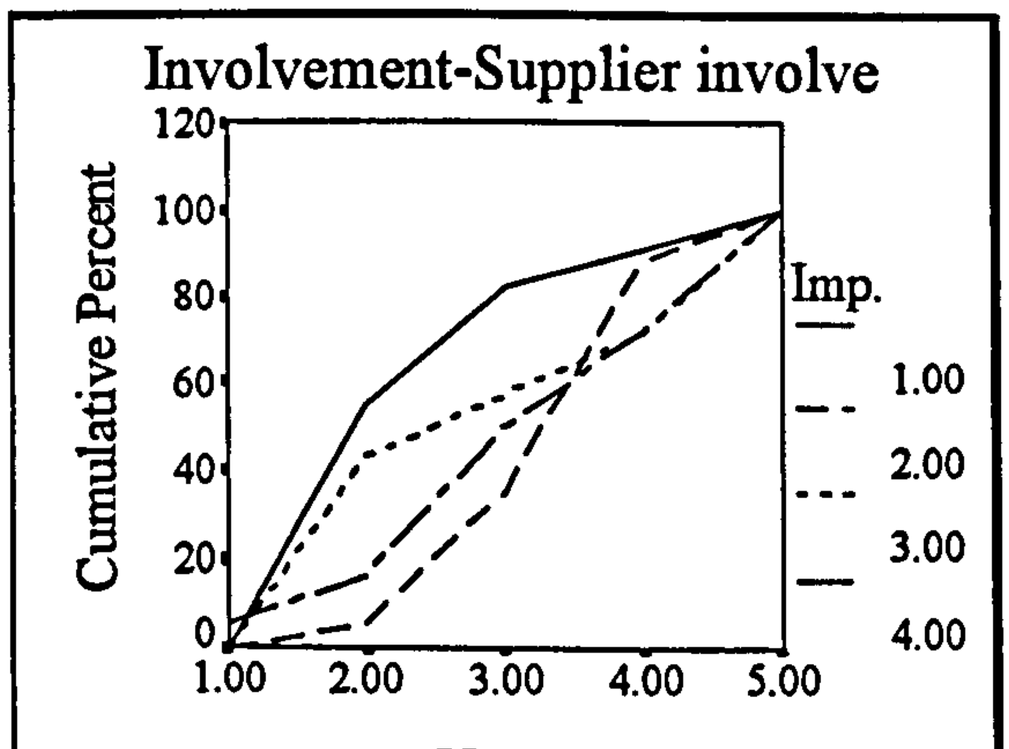






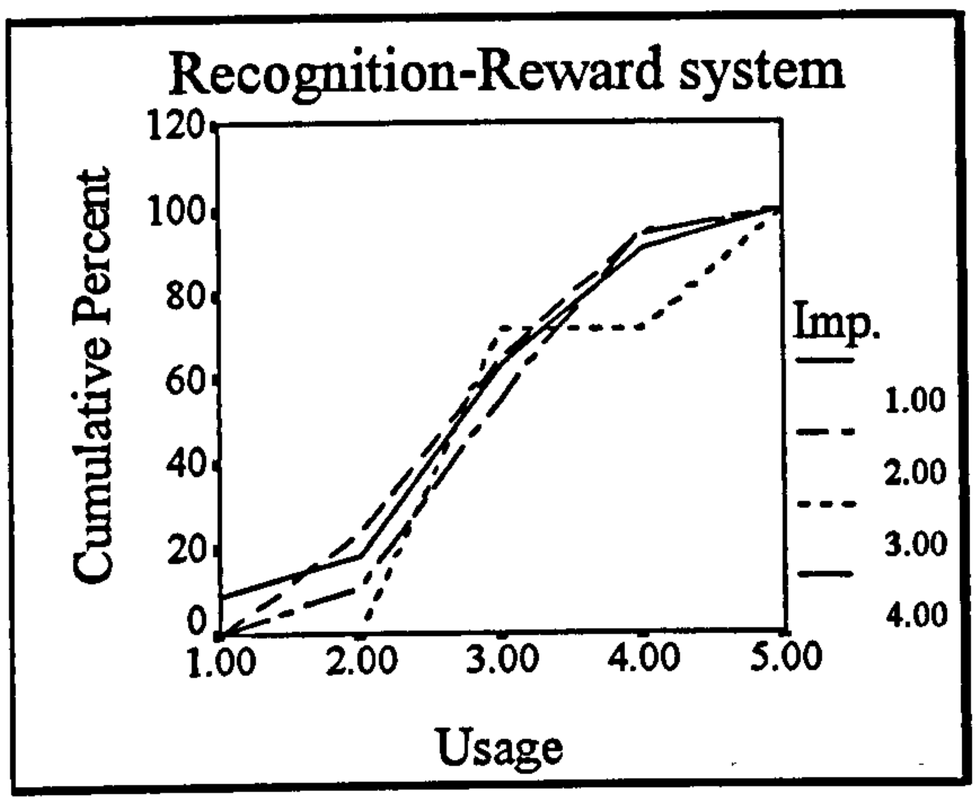


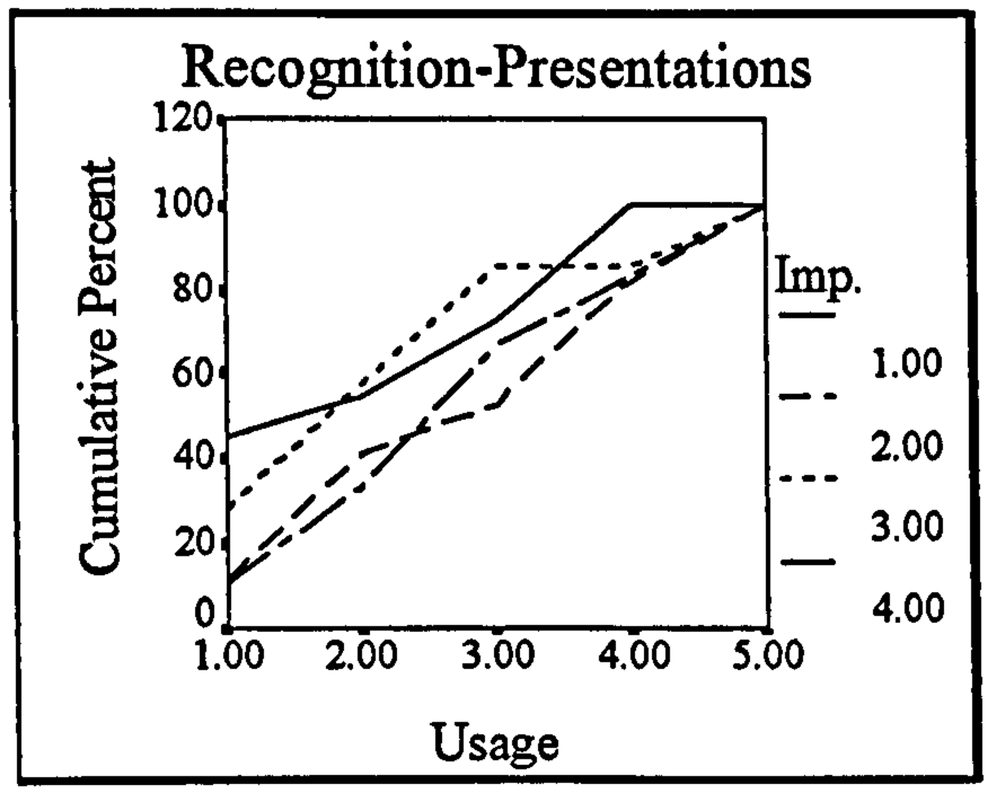


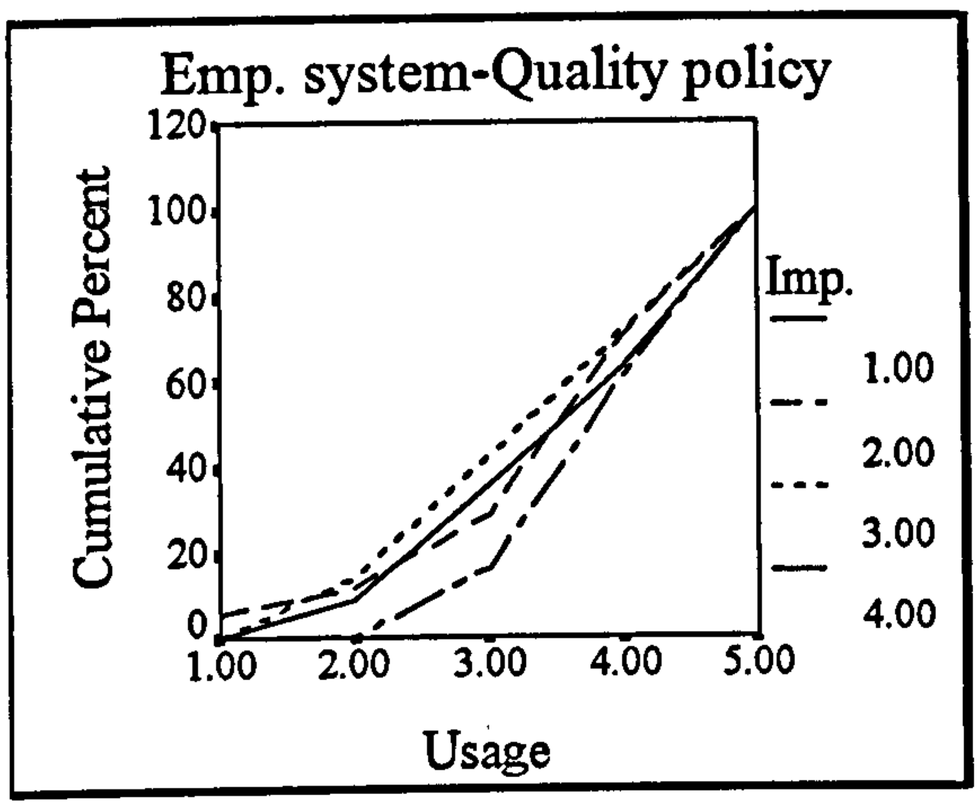


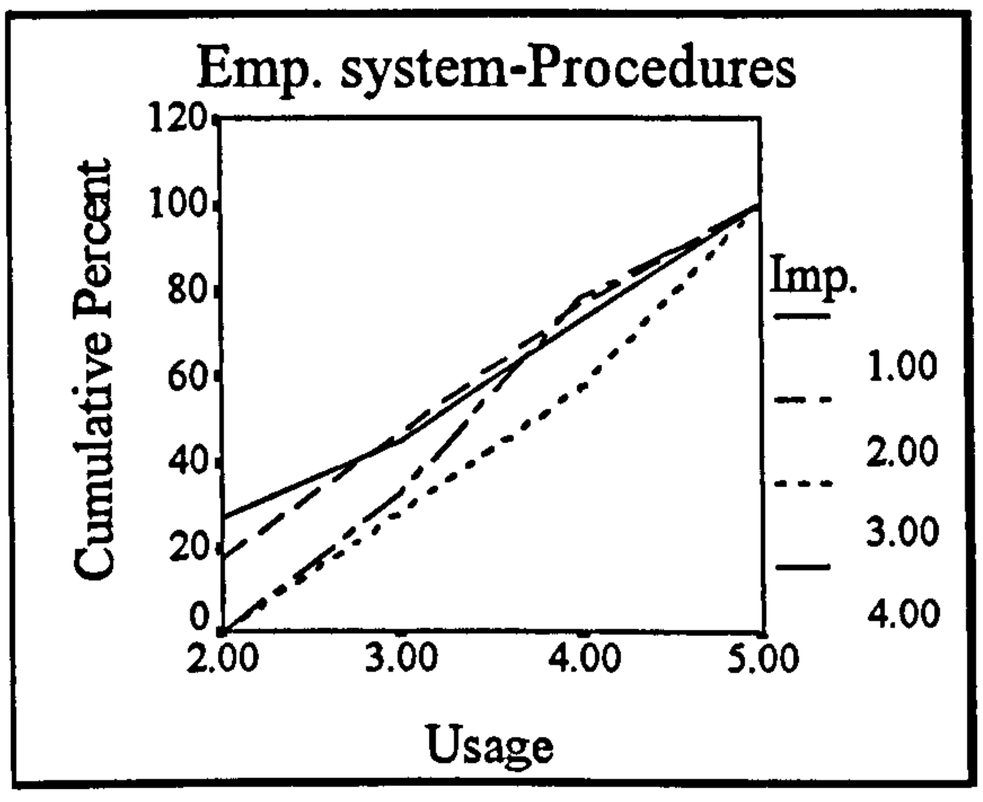
Legend:
Imp. - Implementation Lines
1 - Not at all; 2 - 1 to 3 years; 3 - 3 to 5 years; 4 - above 5 years
Using
1 - Not at all; 2 - using little; 3 - using averagely; 4 - using to some extent; 5 - Using fully

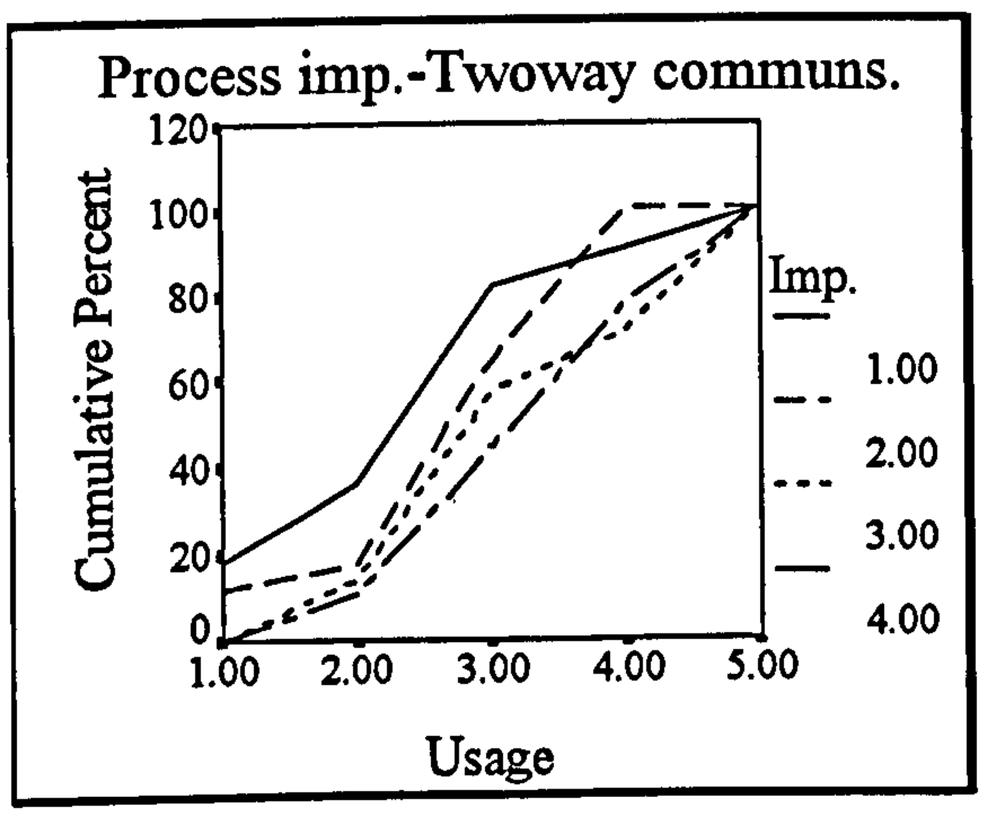
Figure 6.5. Current usage of empowerment activities by implementation groups (contd.)

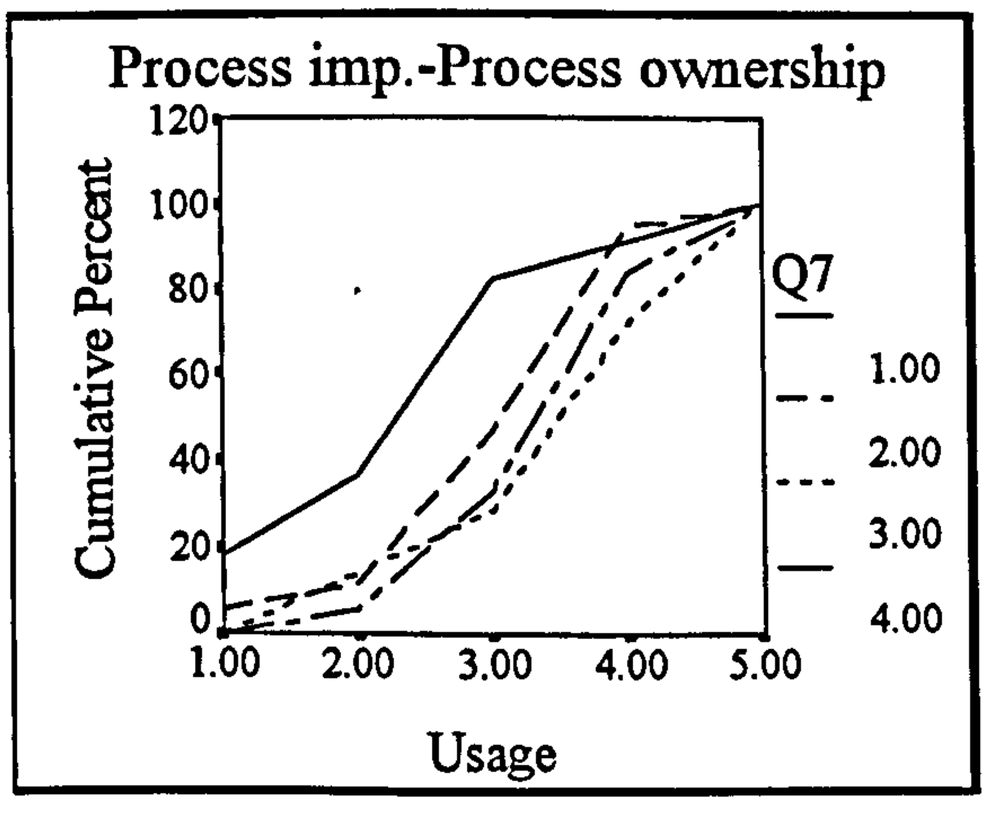






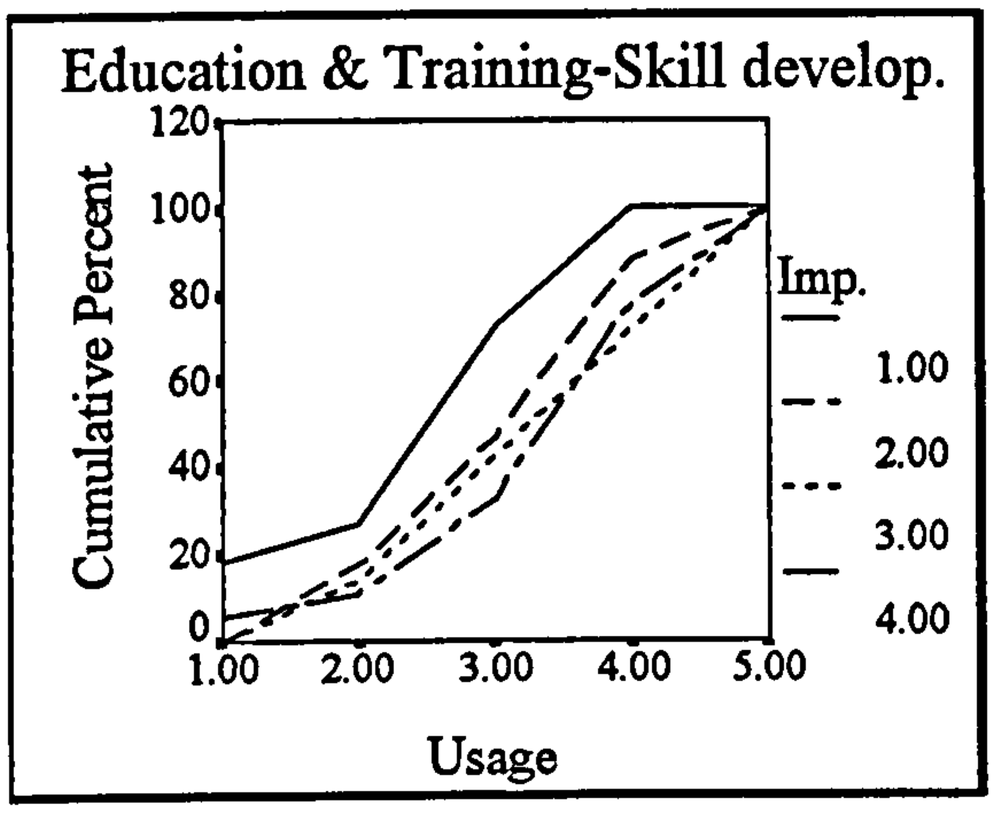


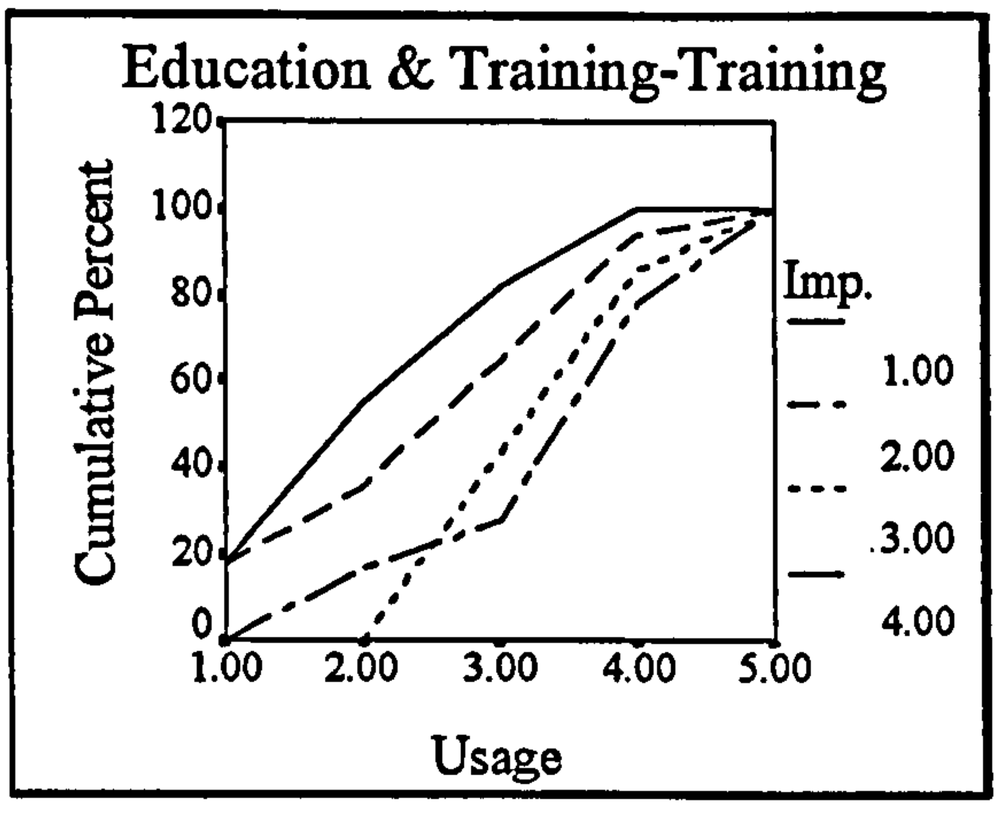


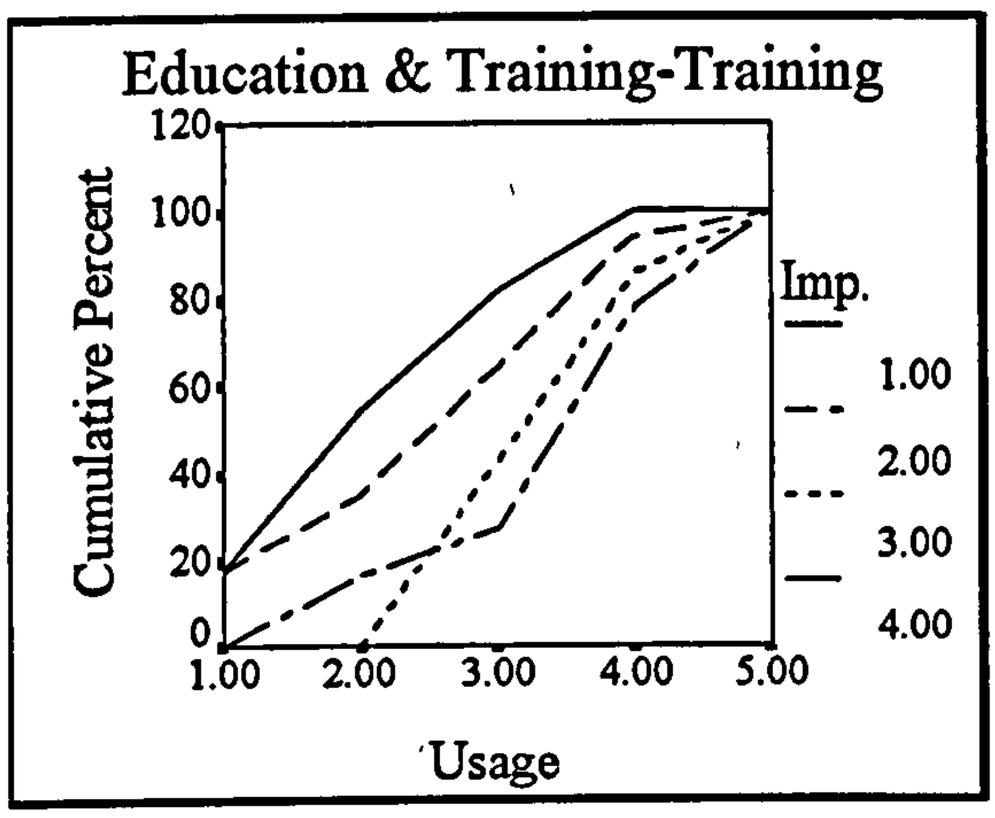


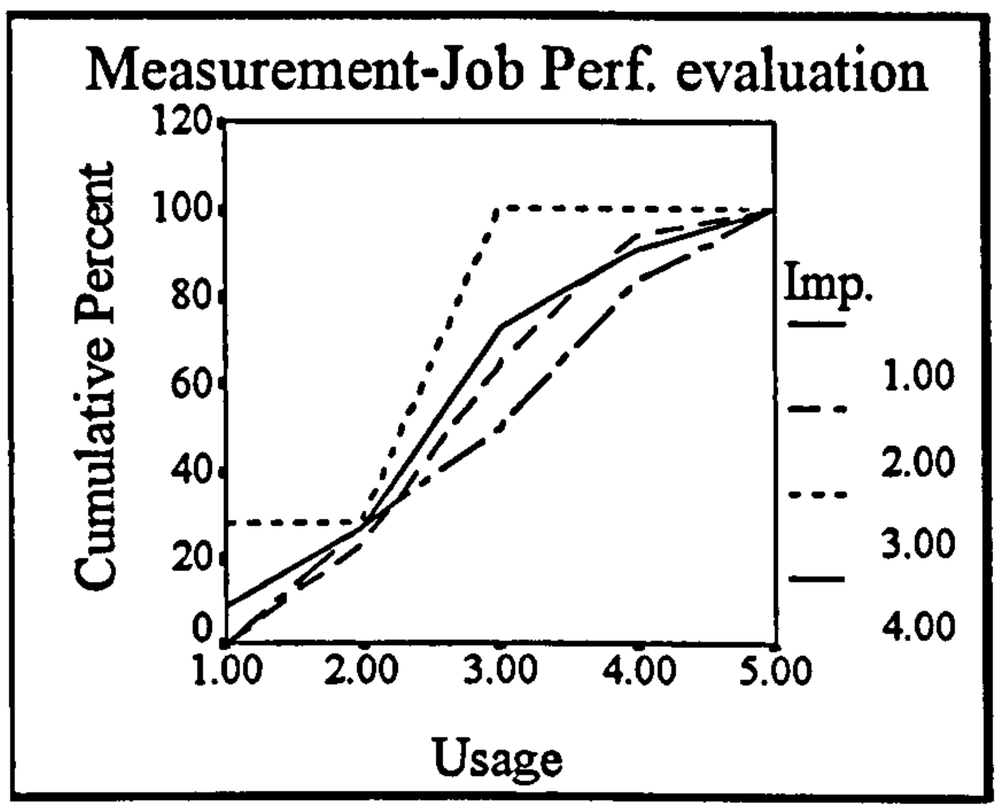
Legend:
Imp. - Implementation Lines
1 - Not at all; 2 - 1 to 3 years; 3 - 3 to 5 years; 4 - above 5 years
Using
1 - Not at all; 2 - using little; 3 - using averagely; 4 - using to some extent; 5 - Using fully

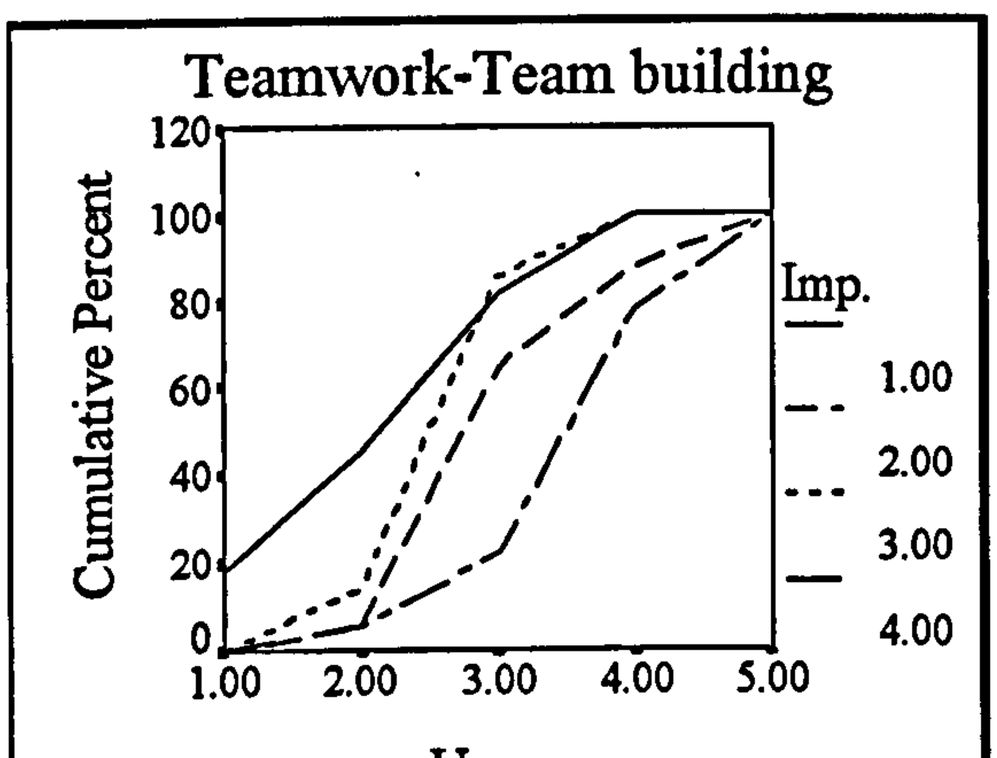
Figure 6.5. Current usage of empowerment activities by implementation groups (contd.)

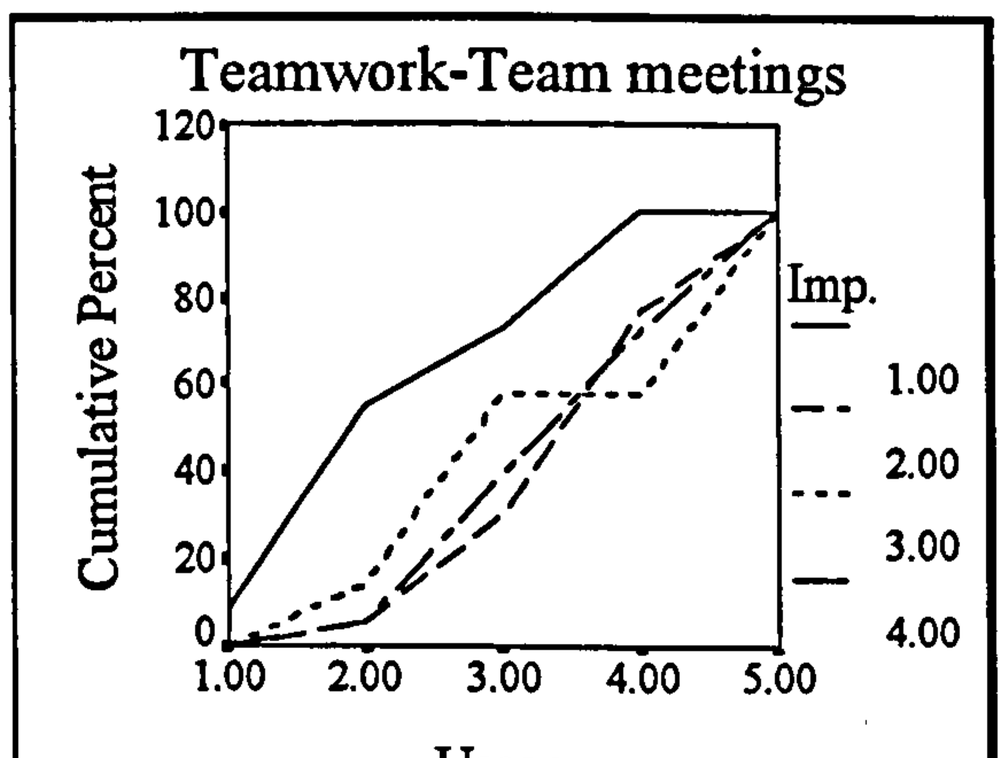












Legend:
Imp. - Implementation Lines
1 - Not at all; 2 - 1 to 3 years; 3 - 3 to 5 years; 4 - above 5 years
Using
1 - Not at all; 2 - using little; 3 - using averagely; 4 - using to some extent; 5 - Using fully

6.5.4 Organisational involvement with empowerment activities

Respondents were requested to indicate the degree of significance regarding involvement of employees (using the involvement Likert scale: 1 - strongly insignificant, to 5 - strongly significant) amongst various levels of the organisation in performing empowerment activities of the nine major implementation elements. Analysis, including median and relative involvement indices (see Figure 6.6) was performed for each of the empowerment elements against the four levels of the organisation (strategic, general, operational, and direct work). Figure 6.6 also includes median scores for each of the variables, which show central tendencies on the involvement scale for each of the variables. Figure 6.6 led to the formation of an 'involvement chart' (see Figure 6.7) for implementing empowerment. The resultant chart is based on highest involvement indices, and can be used to highlight significant involvement of, and input by, the four levels of an organisation in performing the elements. Derivation of both Figures 6.6 and 6.7 has led to the following conclusions:

- Employees at the strategic, general, and operational levels of the organisation assume greater responsibility in implementing empowerment than employees at the direct work level (see the shaded areas in Figure 6.6). In particular, operational level involvement is crucial for the success of implementation followed by strategic and then general. A majority of the elements (including, teamwork, process improvement, recognition, and measurement) are predominantly controlled by operational level employees. In essence, all levels of employee have involvement: see Figure 6.6, which shows that all involvement indices are greater than 0.60 except "direct work" involvement in resources development. However, the degree of involvement and input vary from one level to another.
- The activities of "leadership", "Resources development" and "Empowerment system" require inputs from employees in the descending order of strategic-general-

operational-direct work. These three activities are the domain of senior management, who should create the vision/mission and consequent development of required resources and systems to implement empowerment throughout the organisation. This indicates that the activities of these three elements are top-down processes, where management initiates all the requisites of empowerment and cascades this down towards lower levels.

- Both "teamwork" and "process improvement" receive the following order of involvement: operational-direct work-general-strategic. This is, to some extent, the inverse to the involvement in "leadership", "resources development", and "empowerment system". The activities of "teamwork" and "process inprovement" are the domain of employees at operational and direct work levels, who should be involved to a greater extent in designing and performing them. This ensures that process improvement and efficient teamwork are largely vested with the employees at lower levels, thus they should be developed 'bottom-up'.
- The "involvement" and "education and training" activities are usually employee development activities performed to facilitate the implementation programme. Hence, employees of the general level play an important role in performing them. It can also be seen from Figure 6.6 that both of these activities bear little difference amongst four levels of the organisation in performing them (relative involvement indices between 0.81 and 0.87).
- "Recognition" and "measurement" are dominated by operational level employees. This ensures that "direct work" employees get immediate recognition from their immediate leaders (operational). "Operational" employees are involved in recognising and monitoring (measuring) the performance of employees of direct work.
- Analysis of variance conducted between the groups: manufacturing and construction, indicated no significant differences among them in respect of the involvement of employees of various levels of the organisation (in performing empowerment

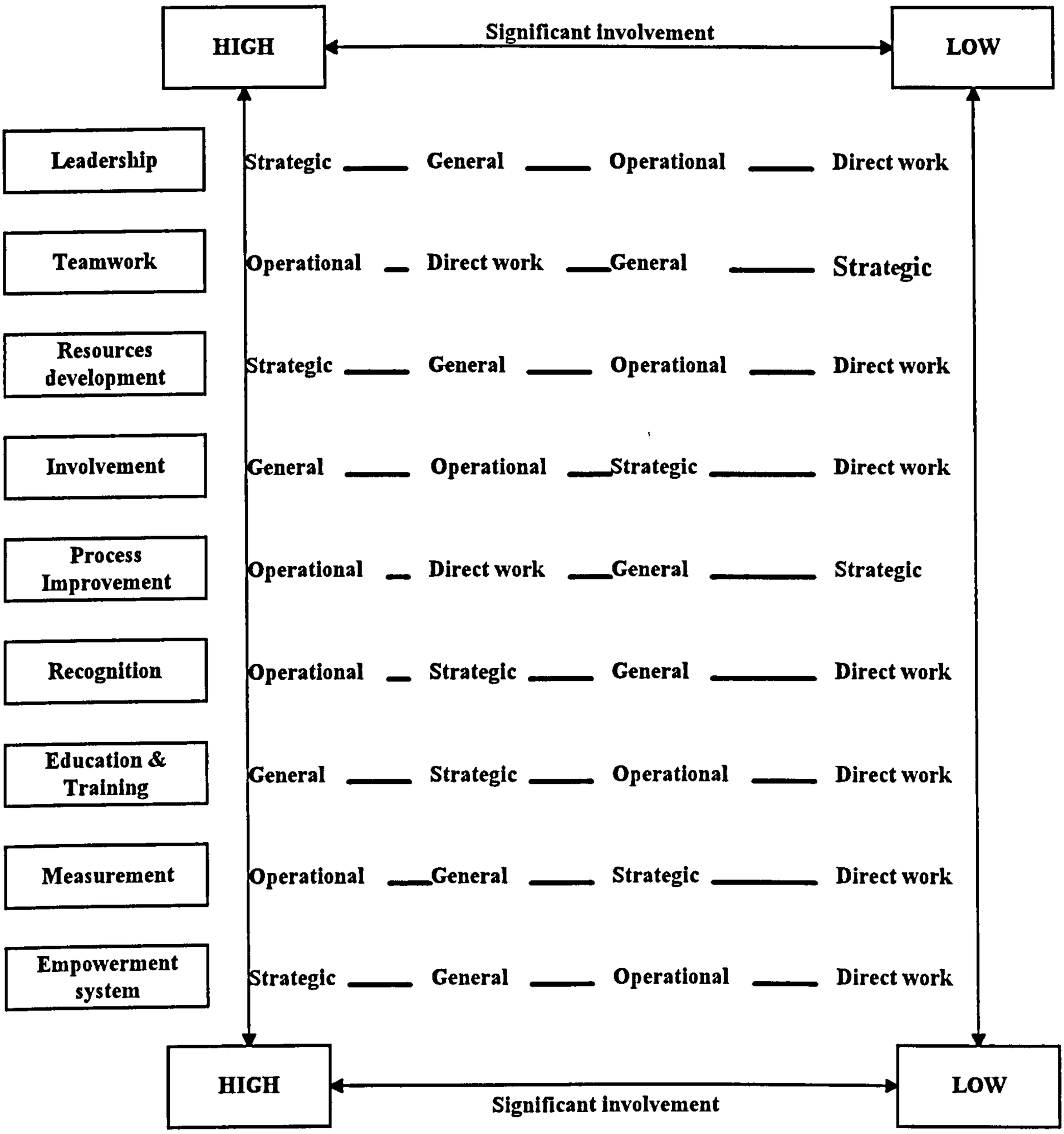
activities). The significances of probabilities of occurrence under null hypothesis of values as large as the H values (Kruskall-Wallis Coefficients) were greater than the set level of significance, $\alpha = 0.05$ for most of the activities (see Table 12 - part I in Appendix B). Thus, the involvement chart (Figure 6.7) is applicable to both the construction and manufacturing sectors.

Figure 6.6 . Significance of hierarchical involvement

Levels of organisation	Leadership	Teamwork	Resources development	Involvement	Process Improvement	Recognition	Education & Training	Measurement	Empowerment system
Strategic	5* (1) 0.93**	5* (4) 0.89**	5* (1) 0.89**	5* (3) 0.86**	4* (4) 0.80**	4* (2) 0.81**	5* (2) 0.87**	4* (3) 0.81**	5* (1) 0.80**
General	4* (2) 0.85**	5* (3) 0.89**	4* (2) 0.80**	4* (1) 0.87**	4* (3) 0.85**	4* (3) 0.80**	5* (1) 0.87**	4* (2) 0.82**	4* (2) 0.76**
Operational	4* (3) 0.79**	5* (2) 0.91**	4* (3) 0.74**	5* (2) 0.87**	5* (1) 0.92	4* (1) 0.85**	5* (3) 0.86**	5* (1) 0.85**	4* (3) 0.75**
Direct work	3* (4) 0.63**	5* (2) 0.91**	2* (4) 0.54**	5* (4) 0.84**	5* (2) 0.87**	4* (4) 0.79**	4* (4) 0.81**	4* (4) 0.78**	3* (4) 0.67**

Legend: * - Median scores; ** - Relative involvement indices; (.) - Rankings based on involvement indices
Shaded areas represent high significance

Figure 6.7. Relative hierachical involvement chart



6.5.6 Empowerment Implementation Profile

One of the primary aims of the development of the 'Empowerment Implementation Profile' (EIP) was to use the profile for selecting suitable organisations for further investigations (case studies). It has been stated in Chapter Four (Section 4.3.3.2) that one of the main

criteria used for identifying appropriate case organisations was "the organisation's level of use of the sixty-two empowerment activities". To achieve this, data obtained by the 'usage' scale was analysed by employing the 'cumulative percentile' test. Since this analysis is to deal with organisations who have implemented empowerment, only 19 out of 27 construction organisations who consisted the respondent sub-set, were eligible. As a first step, the raw scores of the groups of activities attributed to each of the nine elements of empowerment were summed up amongst each of the nineteen organisations (see Table 6.10). Based on these raw scores [having maximum score (for each of the elements) as 100th percentile and minimum score as the 0 percentile), 33rd and 67th cumulative percentiles were calculated for each of the element and presented in the EIP model (Figure 6.8). Where, all scores below the 33rd percentile on the cumulative distribution were classified as 'Low' profiles; all scores that fall between the 33rd and 67th percentile values were classified as 'Medium' profiles; and all scores above the 67th percentile were classified as 'High' profiles. Based on this EIP model, the actual scores of nineteen companies were assessed and designated as Low, Medium or High in using the sixty-two empowerment activities.

Selection of case companies based on the EIP model

As mentioned earlier in Chapter four (section 4.3.3.2), the three main criteria based on which companies selected for case studies include: a minimum of three years the company has been practising the policy of empowerment; company's extent of usage of sixty-two empowerment activities; and their willingness to participate in case studies. The EIP model assesses only the second criterion of the selection process. It can be seen from the Table 6.10 that companies are consistent in using the said activities; those who were 'high' in using one set of activities (element) have consistently used the other set of activities (elements) to either high or medium level (eg. companies 3, 9, 12, 16, and 18). Those who were 'low' in using one element have consistently used the other elements to either

the same low level or to a medium level (e.g. companies 1, 2, 5, 11, and 13). This indicates that companies, more or less, use all of the activities to a similar extent; either low-medium or medium-high. Only eight companies (1, 4, 10, 11, 13, 16, 18, and 19 in Table 6.10) have shown their interests in participating in case study investigations. Except company 1 all of the other seven companies were using empowerment for three years and above. Hence, based on the criteria - minimum of three years experience - company 1 was rejected, because of having only 2 years experience (also this company had very low profile of implementing empowerment - see Table 6.10). The remaining seven companies were assessed based on their profile of implementation using the EIP model. It showed that companies 4, 11, and 13 have low profile of using the empowerment activities. Thus they were also rejected for further investigation. The remaining four companies' i.e. 10, 16, 18 and 19 were chosen for case studies. It can be seen that company 19 is moderately low in using empowerment activities. However, still it was included as being moderately higher in using activities than companies 4, and 11. At the stage of case study investigations, company 10 had withdrawn its willingness to participate. Subsequently, only the remaining three companies (16, 18, and 19) were finally studied. The EIPs for each of these three companies are highlighted in the Table 6.10.

How to use the EIP

The EIP aimed to evaluate companies (regarding the level of use of empowerment activities) for further investigation through case studies. However, it can also be used by construction organisations to benchmark their level of implementation with the EIP model. In order to do this, first they have to answer section two of the empowerment-qustionnaire (Appendix A). Then, sum up the scores of groups of activities attributed to each of the empowerment elements. Having nine scores each respectively for nine elements, the next process is comparing these scores with the EIP model (Figure 6.8).

Based on the outcome as the level of implementation being 'Low', 'Medium', or 'High', action plans can be developed for further improvement.

Table 6.10. Sum of raw scores of empowerment elements and assessment of implementation pofile for organisations involved in empowerment

Compa -ny	Leader -ship	Teamw -ork	Res. Devel.	Involve -ment	Process Impro.	Recogn -ition	Edu. & Traing.	Measu- rement	Emp. System
1	16 (L)	18 (L)	10 (M)	17 (L)	16 (L)	5 (L)	19 (L)	14 (M)	8 (L)
2	16 (L)	42 (H)	10 (M)	19 (L)	36 (H)	6 (L)	15 (L)	11 (L)	14 (M)
3	29 (H)	39 (H)	12 (H)	29 (H)	35 (M)	15 (H)	35 (H)	24 (H)	21 (H)
4	17 (L)	24 (L)	10 (M)	18 (L)	28 (M)	7 (M)	28 (M)	14 (M)	9 (L)
5	19 (L)	19 (L)	10 (M)	19 (L)	22 (L)	7 (M)	23 (L)	12 (L)	10 (L)
6	20 (M)	25 (L)	12 (H)	22 (M)	29 (M)	6 (L)	28 (M)	12 (L)	17 (H)
7	22 (M)	27 (M)	10 (M)	25 (H)	27 (L)	7 (M)	28 (M)	18 (M)	13 (M)
8	25 (M)	32 (M)	11 (M)	23 (M)	28 (M)	7 (M)	29 (M)	18 (M)	15 (M)
9	30 (H)	46 (H)	14 (H)	29 (H)	42 (H)	8 (M)	32 (H)	21 (H)	20 (H)
10	24 (M)	32 (M)	10 (M)	20 (M)	33 (M)	12 (H)	29 (M)	21 (H)	9 (L)
11	19 (L)	29 (M)	7 (L)	16 (L)	26 (L)	6 (L)	21 (L)	13 (L)	11 (L)
12	29 (H)	36 (M)	11 (M)	24 (M)	38 (H)	10 (H)	34 (H)	24 (H)	17 (H)
13	17 (L)	22 (L)	10 (M)	17 (L)	26 (L)	6 (L)	32 (H)	20 (M)	12 (M)
14	29 (H)	38 (H)	12 (H)	25 (H)	38 (H)	12 (H)	35 (H)	22 (H)	24 (H)
15	24 (M)	32 (M)	10 (M)	20 (M)	33 (M)	12 (H)	29 (M)	21 ((H)	9 (L)
16	**24 (M)**	**35 (M)**	**12 (H)**	**24 (M)**	**37 (H)**	**14 (H)**	**30 (M)**	**22 (H)**	**20 (H)**
17	29 (H)	37 (H)	13 (H)	30 (H)	36 (H)	10 (H)	35 (H)	21 (H)	22 (H)
18	**33 (H)**	**37 (H)**	**11 (M)**	**29 (H)**	**38 (H)**	**9 (M)**	**37 (H)**	**21 (H)**	**17 (H)**
19	**28 (M)**	**21 (L)**	**12 (H)**	**22 (M)**	**21 (L)**	**7 (M)**	**25 (L)**	**10 (L)**	**14 (M)**

Legend: L - Low profile; M - Medium profile; H - High profile.
Note: Implementation profiles were designated for each of the elements based on the EIP model (Figure 6.8). The EIPs of case study companies are highlighted.

Figure 6.8. Empowerment Implementation Profile (EIP)
[A measurement (bench marking) tool to assess (construction) organisational level of empowerment implementation]

		LOW (L)		MEDIUM (M)		HIGH (H)	
Percentile Score		**0%**	**to**	**33%**	**to**	**67%**	**to** 100%
RAW SCORE	**Leadership**	----------16.0		----------19.6		----------28.4	----------33.0
	Teamwork	----------18.0		----------26.2		----------36.4	----------46.0
	Resources development	----------07.0		----------10.0		----------12.0	----------14.0
	Involvement	----------16.0		----------19.6		----------24.4	----------30.0
	Process improvement	----------16.0		----------27.6		----------36.0	----------42.0
	Recognition	----------05.0		----------07.0		----------10.0	----------15.0
	Education & Training	----------15.0		----------28.0		----------32.0	----------37.0
	Measurement	----------10.0		----------14.0		----------21.0	----------24.0
	Empowerment system	----------08.0		----------11.6		----------17.0	----------24.0

Note: This profile has been produced using data obtained from nineteen construction organisations implementing empowerment.

6.6 Conclusions drawn from the survey analysis

Following conclusions are drawn from analysis of the questionnaire survey data:

Importance and usage of activities

- Sixty-one out of the total sixty-two activities were perceived by respondents as being critical for the implementation of empowerment. The activity - Advisory committees - was perceived as less important by both the manufacturing and construction sectors. Thus, this activity was ommitted from the activity model.

- Rankings of nine major empowerment elements indicated that leadership and teamwork are considered the most important, followed by resources development, involvement, process improvement, recognition, education and training then measurement, and empowerment system. Rankings of activities show that facilitation, encouragement, team building, and working conditions are critical activities for management, whilst, process ownership, customer satisfaction, reward system, and skill development are critical for employees in the implementation process of empowerment. These results indicate that the role of senior management in motivating employees and providing them necessary resources and environment is crucial for effective implementation. This also concurs with the literature (Chapter Three and Chapter Five) that development of employees' skills and subsequent recognition of their achievements elevates their efficacy and encourages ownership of their processes in delivering high quality service/product to customers.
- Rankings of the use of empowerment activities indicated that senior management activities such as encouragement, funding, working conditions, team building, and employees' activities such as process ownership, skill development, and problem solving are more highly used than the other activities. Analysis of the construction and manufacturing sub-samples showed that construction uses the activities equally as much as the manufacturing sample. However, manufacturing is slightly ahead in using the activities.
- A correlation analysis employed between rankings of respondents' 'agreement' and 'usage' indices resulted in positive correlation confirming that respondent companies employ the empowerment activities within their organisation to the same extent as they perceived them as being important. This underlines the validity of the activity model shown in Figure 6.1.

Analysis of subgroups

- Analysis of variance between the construction and manufacturing sectors indicated difference of perception on nine out of sixty-two activities. These activities are: employee involvement; customer involvement; problem solving; statistical process control; process evaluation; quality function deployment; training; skill development; technical cross-training; and self-directed work teams. Further investigations of these nine activities showed that the manufacturing sample agreed more strongly than the construction sector. However, both of them are within the 'strong' agreement region, i.e. exhibit agreement indices > 0.80.
- The analysis of variance among the groups of implementators showed that those who have greatest experience of implementing empowerment agreed more strongly with the activities than those who were less experienced or had not implemented empowerment.
- The analysis of variance among the groups of 'awareness on empowerment' indicated that those who were fully aware of the concept of empowerment agreed more strongly with the activities than those who were less aware. In essence, the ANOVA test concluded that, those who are highly knowledgeable on, and experienced with, empowerment have recognised the activities as very important for the effective implementation of empowerment.
- Analysis of variance among groups of implementators showed that organisations with greatest experience of empowerment have used more activities to a larger extent than those who were less experienced, or had not implemented empowerment.

Organisational involvement

- Employees at the strategic, general, and operational levels of the organisation assume greater responsibility in implementing empowerment than employees at the direct work level (see the shaded areas in Figure 6.6). In particular, operational level

involvement is crucial for the success of implementation followed by strategic and then general. A majority of the elements (including, teamwork, process improvement, recognition, and measurement) are predominantly controlled by operational level employees.

- The activities of "leadership", "Resources development" and "Empowerment system" require inputs from employees in the descending order of: strategic-general-operational-direct work. These three activities are the domain of senior management, who should create the vision/mission and consequent generation of required resources, and development of systems to implement empowerment throughout the organisation. This indicates that the activities of these three elements are top-down processes, where management initiates all the requisites of empowerment and cascades this down towards lower levels.
- Both "teamwork" and "process improvement" receive the following order of involvement: operational-direct work-general-strategic. This is, to some extent, the inverse to the involvement in "leadership", "resources development", and "empowerment system". The activities "teamwork" and "process improvement" are the domain of employees at operational and direct work levels, who should be involved to a greater extent in designing and performing them. This ensures that process improvement and efficient teamwork are largely vested with employees at lower levels, thus they should be developed 'bottom-up'.
- The "involvement" and "education and training" activities are usually employee development activities performed to facilitate the implementation programme. Hence, employees at the general level play an important role in performing them.
- "Recognition" and "measurement" are dominated by operational level employees. This ensures that "direct work" employees need immediate recognition from their immediate leaders (operational). "Operational" employees are involved in recognising and monitoring (measuring) the performance of employees of direct work.

- Analysis of variance conducted between the groups: manufacturing and construction, indicated that there is no significant differences among them in respect of the involvement of employees at various levels of the organisation (in performing empowerment activities). Thus, the involvement chart (Figure 6.7) is applicable to both the construction and manufacturing sectors.
- Use of the EIP model in the assessment of respondent companies profile of empowerment indicated that each of those who are implementing empowerment is consistent in using all of the sixty-two activities to a similar degree. That is, companies used all activities to a same profile, i.e. 'Low', 'Medium', or 'High'.

6.7 Summary

This chapter has analysed data obtained from the questionnaire survey with the aim of evaluating empowerment activities, (as identified from the literature review), for their feasible use in the construction sector. Several statistical tests including frequency analysis, relative indices, analysis of variance, correlation, cumulative distribution curves, and cumulative percentiles were employed. Results of the analysis revealed a demonstrable coincidence between the findings of the literature review and their practical applications to construction organisations. Conclusions drawn from the analysis have been collectively reported in section 6.6.

In essence, the findings indicated that except the activity - 'Advisory committees' - all of the sixty-one activities are more or less critical for effective implementation of empowerment in construction organisations. The analysis also showed significant involvement of four levels of an organisation (strategic, general, operational, and direct work) in performing these activities. This analysis indicated that senior management has a greater role in implementing empowerment, including: creating awareness among

employees; showing continuous commitment; providing a suitable environment and the necessary resources for implementation; and educating and training employees. Finally, the analysis concluded with development of an activity model and a model for measuring implementation profiles (EIP model). These models will assist construction organisations in producing (and/or measuring) empowerment implementation efforts.

Having confirmed that the said activities are important and highlighted the possible involvement of various levels of employees in performing them, the next phase of the research was to explore how these activities can be effectively performed within the process of empowerment implementation. This, subsequently led to the development of an empowerment implementation model for effectively implementing empowerment within construction organisations (Chapter Eight).

Chapter Seven

Modelling the Implementation Process of Empowerment

7.1 Introduction

The main aim of the case study data analysis was to: compare and contrast the commonality and differences amongst empowerment systems of different construction organisations; to produce a generic model that represented collectively, best practices for empowerment implementation; and map the efficacy information. This chapter discusses relevant systems modelling tools and techniques, that were considered in striving to effectively satisfy these aims, and concludes by identifying the most appropriate technique for this research.

7.2 An overview of systems modelling techniques relevant to this research

An appropriate modelling technique has to be decided based on the nature of the research and type of model the research primarily intended to produce. It can be understood from Chapters Two and Three that this research had to rely heavily on investigating the social systems of construction organisations in order to develop an efficient empowerment implementation model. Since empowerment deals predominantly with human (employee) activities (related to the social system of a business organisation), the chosen modelling technique would need to be able to map and link human activities involved in empowerment along with their key processes (if any) and their respective information. Checkland (1981) has previously argued for the use of a 'soft' system (methodology) in contrast to 'hard' methods when attempting to develop a human activity system. He proposed a seven-step model (of soft system methodology) for solving ill structured

problems (e.g. investigating why the recently introduced new system has failed). The seven steps are:

1) the problem situation: unstructured;

2) the problem situation expressed;

3) root definitions of relevant systems developed;

4) conceptual models are developed based on the root definitions;

5) comparison of steps 4 and 2;

6) identify feasible, desirable changes; and

7) and take action to improve the problem situation.

In essence, by using this methodology one can develop a conceptual model, comprised of a set of human activities logically interlinked, in solving ill structured problems of the real world. Conceptual models describe what a system does; i.e. what (activities) should go on in the system and in what order. It does not tell how the activities are performed. However, information systems are 'hard' systems which describe, for each activity or process: What information is needed to do it? In what format? From what source? and How frequently? (Checkland, 1981).

In organisational studies, Checkland argued that information systems design must stem from a (conceptual) model of the activity system served. That is, after developing an activity system, one can efficiently develop a detailed information system as to what information, in what format, and from what source for each of the activities can be established. However, within the methodology that this research has adopted, Checkland's proposition could not be followed, because, it was designed to solve (ill structured) problems within a particular individual organisation. Where as, this research has adopted a methodology, in which, current physical systems of three companies were investigated. That means, it was dealing with hard systems of existing companies, from which a generic

system was intended to develop. In this case, soft systems approach (i.e. development of a conceptual model followed by a hard system model) cannot be applied. Checkland's soft systems approach is more suitable to solve problems (ill structured) within an organisation. This view has also been agreed by Fisher and Yin (1992).

The methodology of this research needed to investigate certain organisations (case studies) with a view to understanding *how* they were implementing empowerment. This modelling of current implementation would then result in development of separate models for each of the case study companies showing details of: what the activities (or processes) are; how they are interlinked; in what sequence; what information is needed to perform; in what format; and from what source. To achieve these detailed observations, a reverse process of Checkland's approach was deemed suitable. That is: firstly, a 'hard' systems (information systems) modelling technique was applied to observe detailed implementation approaches of case companies (because the main intention at this stage was to observe the 'hows?' of implementation), and consequently develop a generic model based on implementation approaches identified from those cases. Secondly a conceptual model (an activity model dealing only the 'whats?' of the system) was derived from the generic model. This approach was logical, appropriate and perfectly suited to both overall aims and methodology of this research. Such a methodology has successfully been adopted by other researchers (e.g. Mann, 1992; Stephenson and Oxley, 1985). The reason for developing a conceptual model was that, previous research (e.g. Burati and Oswald, 1993) which investigated implementation of new concepts (e.g. TQM) concluded that there can be no one best (hard) system that can be readily adopted by all organisations. Since organisations vary in terms of structure, culture, and size, a same (hard) system can not be applied to all of them. Where as, conceptual models provide systems that are more flexible and generic in nature, and that organisations having suitable (organisational) features can easily adopt them.

A survey of the literature revealed several key works on systems analysis. For instance, traditional process analysis techniques such as Process Sheet, Process Flow Map, Multiple Activity Chart, Network Diagram, Gantt Chart, Blueprint Flow Map, Logic Flow Chart, Procedure Flow Map, and Function/Process Map were identified (Hunter, 1994). These techniques are designed to solve specific problems within a business system. For example, the Procedure Flow Map was invented in the 1950's by Ben Graham to map office procedures(Hunter, 1994). Other structured techniques include: HIPO Diagrams (Hierarchical Input, Process Output) (Martin and McClure, 1985); Warnier-Orr Diagrams (Martin and McClure, 1985); Action Diagrams (Gharib, 1991); and Decision Trees (Martin and McClure, 1985). These techniques are useful to analyse and present a system at an abstract level; they are not very useful for complex 'hard' systems. For instance, in Functional Decomposition, a high level function is decomposed into a tree structure of lower level functions. It can be applied to structures of organisations, programs, files and reports. These types of techniques, can of course be used in systems analysis, but only as supplementary tools to present and/or categorise observations at an abstract level. However, the main objective of this research was to model detailed implementation systems of empowerment in practice, amongst three different organisations (cases). In this situation, a modelling technique that enables one to map a vast number of complex procedures and activities along with respective information details is essential.

The key works on system analysis fall into two distinct groups: those that base their analysis on 'data structure'; and those that base their analysis on 'data flow' (Fisher and Yin, 1992). Data structure shows how data is grouped and related in the context of the business requirements of a system (this is illustrated in detail later in this section). However, the Structured Data Analysis (SDA) approach, maps flows of data, their passage through an observed system, their transmission and co-ordination, exactly as they are observed, and in the process records a much more complete picture. Fisher and Yin

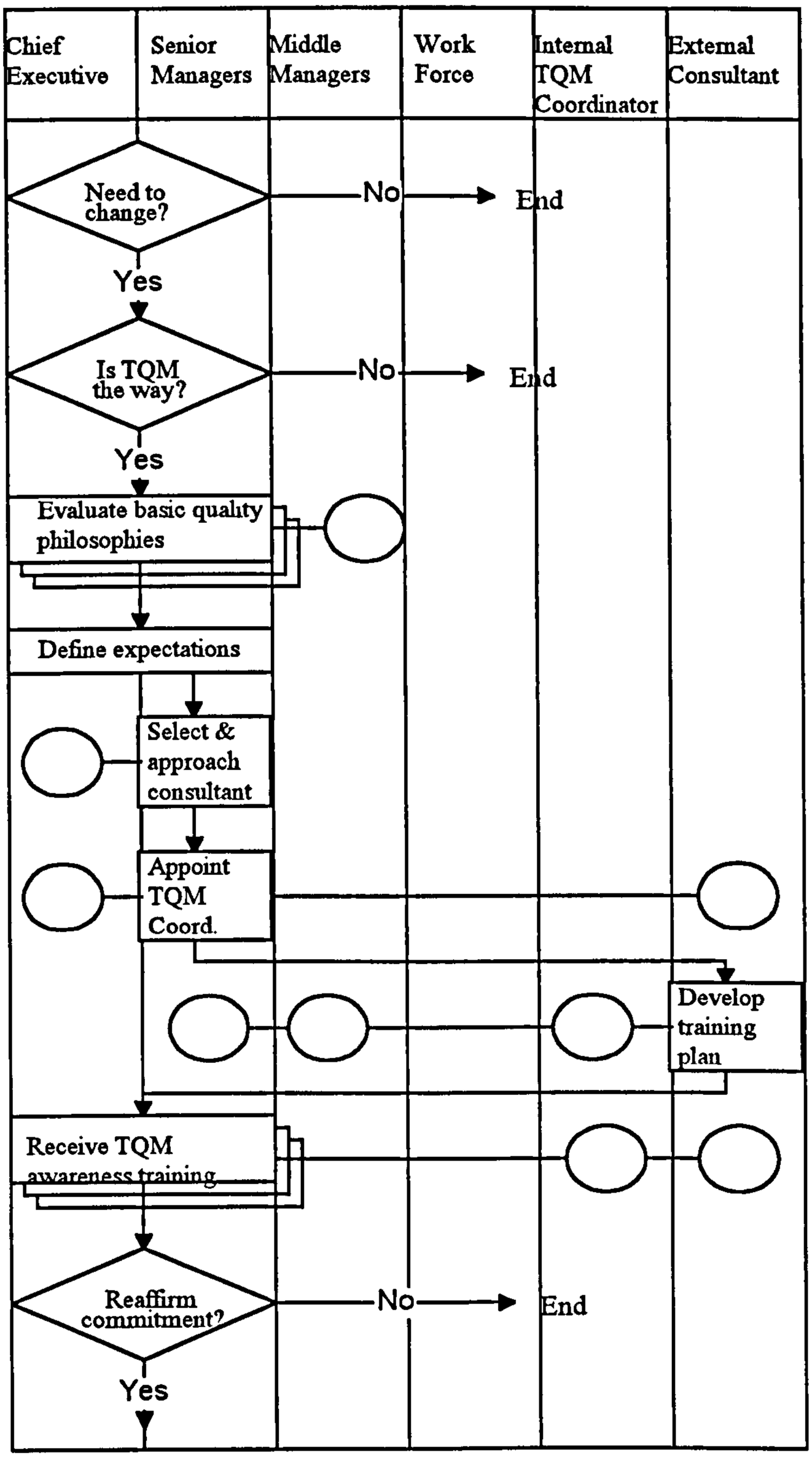
argued that for management system researchers SDA provides a consistent basis for describing data flows within organisations. It was not until the late 1980's (when SDA techniques were developed for system analysis purposes) that they were used to model construction processes (Hassan, 1996). The SDA consists of a number of related analysis tools one of which is the Data Flow Diagram (DFD). Some of these tools are relevant to this research, and were considered for the case study analysis. Those which are particularly suitable are discussed below.

7.2.1 System flow chart

The system flow chart is an established technique that highlights the flow of data between departments, sections or personnel (Skidmore, 1994). There are several ways of using flow charts in system analysis. However, all concentrate on similar principles. A system flow chart approach has previously been used in the implementation of TQM in construction organisations (see Figure 7.1). This approach is particularly relevant to this research.

The flow chart is divided into columns with the name of each department, function or personnel defined at the top. The horizontal placement of an element on the chart indicates the 'who', according to the labels across the 'responsibility bar' at the top of the chart. Participant(s) or helper(s) of a particular event (activity) is represented by circles. An activity or task is represented by a rectangular box, and for multiple activities by multiple boxes. At the point where a decision is to take, a diamond shaped box bears the command.

Figure 7.1. A system flow chart of TQM : exploration and commitment phase



(Adopted from Burati et al, 1993)

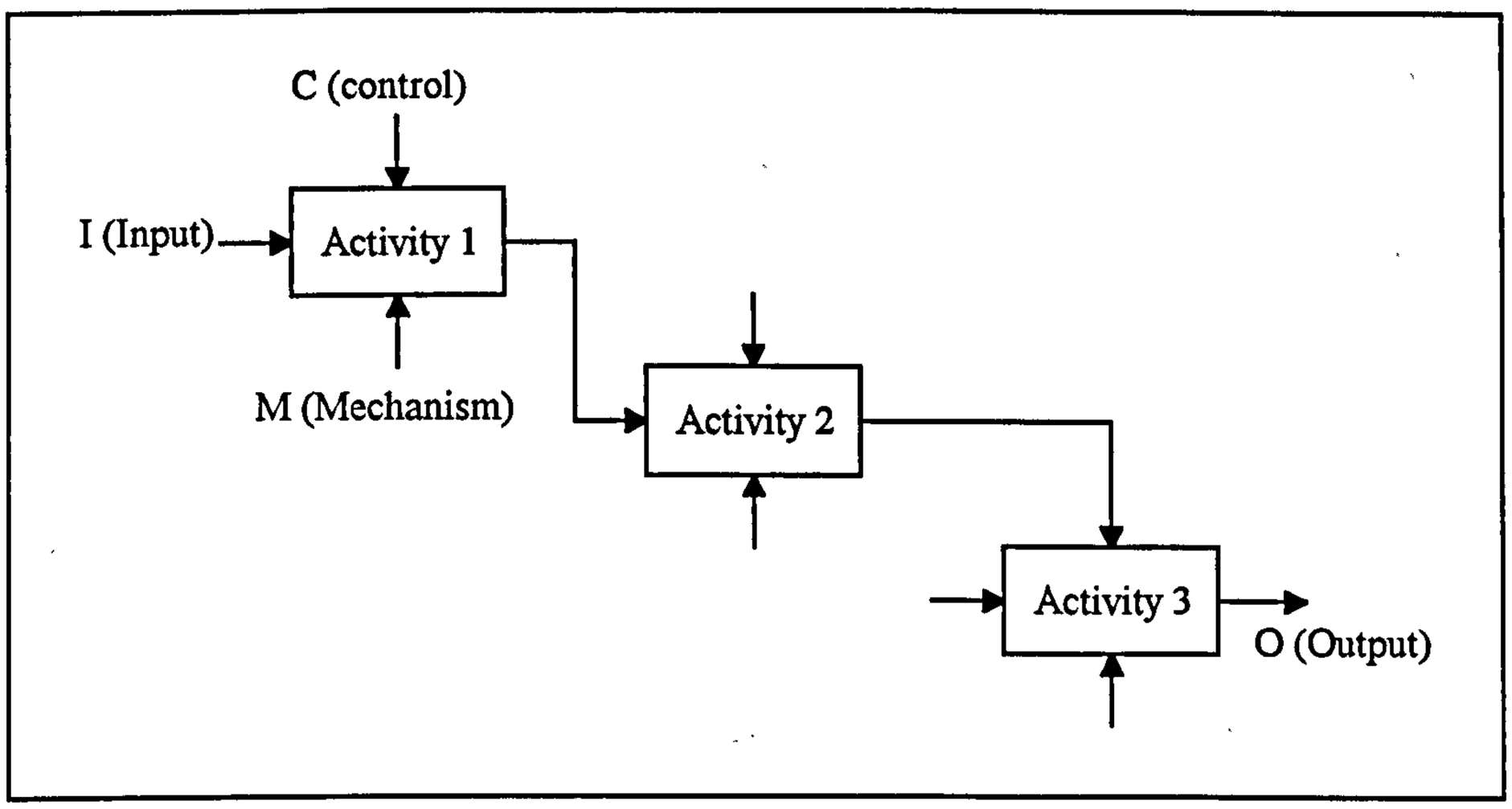
In essence, system flow charts enable one to map the sequence of operations or activities, and respective controlling mechanism(s) by showing the involvement of actors and

participants. This approach is more relevant if the anticipated implementation system will have fewer entities and activities. For a more complex system (that addresses a great number of activities and respective entities involved in performing those activities), a system flow chart will be uncontrollable. The main reason is that the system flow chart is an end in itself, i.e. it could not be used for further decomposition, in the case, if the system is a complex one. Another disadvantage is that it does not show effectively the information flows amongst entities, which, in contrast, is important in the context of this research. Mapping the information flow is crucial for this research, because it shows what type of information (e.g. efficacy information) flows between entities, and how it flows (e.g. top-down, bottom-up, horizontal) in the implementation process of empowerment. In view of the failure of the system flow chart approach to achieve these objectives, it has been found little efficient to use in this research.

7.2.2 IDEF0 technique

IDEF0 (Integrated Computer Aided Manufacturing Definition) is a refined version of the more well known Structured Analysis and Design Technique (SADT) (Colquhoun et al, 1993; Mann, 1994; Hassan, 1996). IDEF0 was developed for U.S. Air Force factory modernisation projects in the late 1970's and early 1980's. IDEF0 begins by defining clearly the system or activities and their sequence to be mapped. The activities are connected by a network of arrows representing the inputs, outputs, controls, and mechanisms (see Figure 7.2). The Activity Box must contain a verb phrase such as 'Produce vision' and the arrows a noun phrase like 'vision'. The arrows may consist of information, data, physical objects or people, indeed, everything that is used by or produced by an activity. Each activity block may be a component of another higher level block (parent diagram) and may itself be decomposable into more component blocks (children diagrams).

Figure 7.2. An example of an IDEF0 Diagram



The IDEF0 techniques have been found most suitable for ananlysing manufacturing processes with a view to improving productivity (Mann, 1994; Hassan, 1996). However, in the implementation of change process (which largely deals with human activities), this approach is less suitable, because, sources and destinations of data linking several activities could not be better read in this approach. Similar conclusions in this respect have been arrived at by other researchers (Maji, 1988; Hassan, 1996). A sepecific weakness is that two way communications between entities cannot be well represented through the IDEF0 approach. Because of these limitations, the method has been ignored for this research.

7.2.3 Data Flow Diagrams

Data Flow Diagrams (DFD) show the passage of data through a system. They focus on the processes that transform incoming data flows (inputs) into outgoing data flows (outputs). The most significant characteristics of DFD are that they are: graphical;

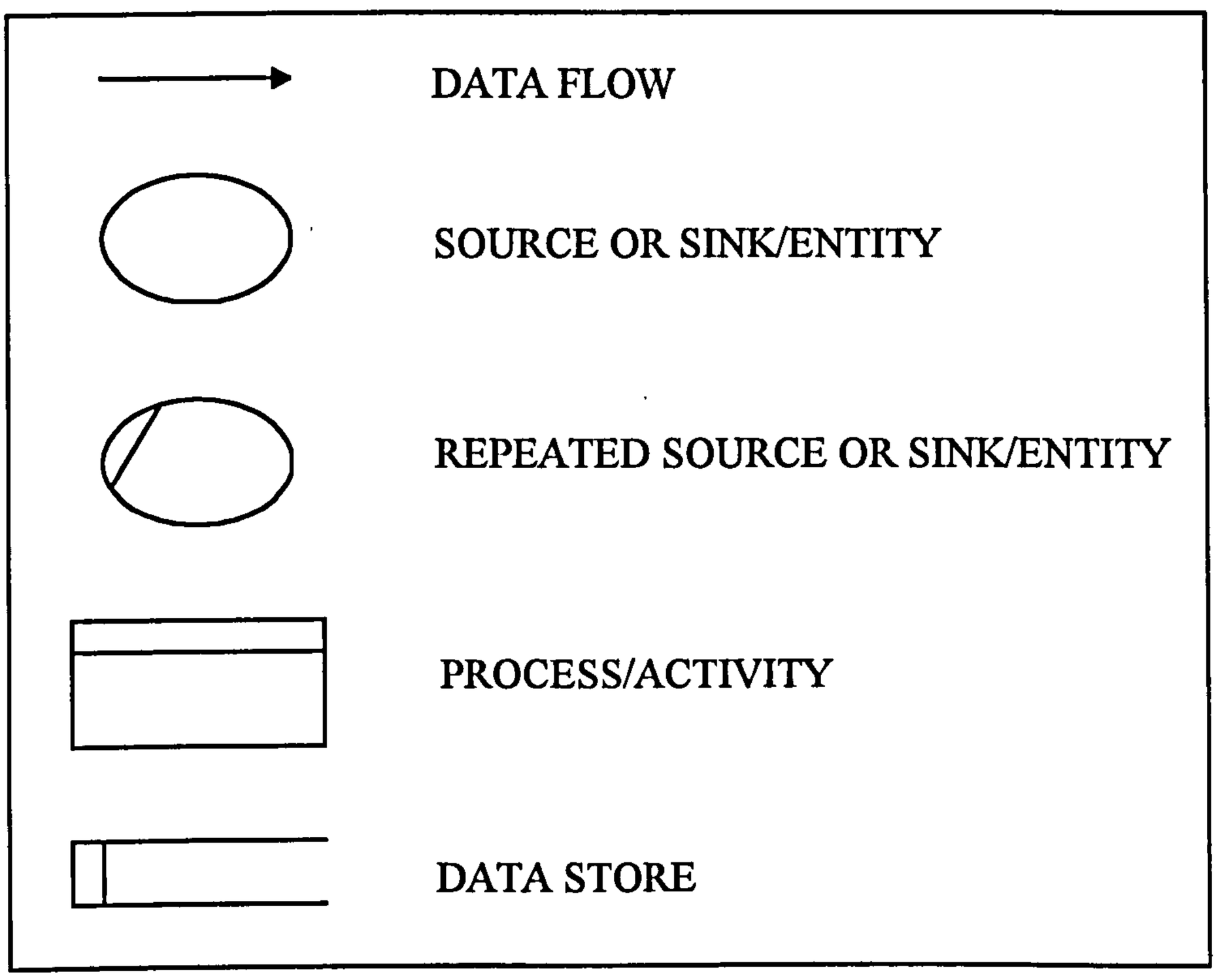
partitioned; multi-dimensional; and emphasise the flow of data rather than control (Fisher and Yin, 1992). There are several versions of data flow diagrams: Gane and Sarson; and Yourdon and Demarco (Hassan, 1996). There are few differences amongst these versions, except the modelling notations of each of these versions. Hassan stated that the Gane and Sarson's version adopts more sophisticated notation to build a DFD which are mainly oriented towards software building. This version has different notations for different flows (for example separate notations each for a data flow and a resource flow). SSADM (Structured Systems Analysis and Design Methodology) belongs to this version. Other key differences in notation are: the process or an activity is represented in Yourdon and Demarco by a circle, in SSADM by a rectangular box; source or sink is represented in Yourdon and Demarco by a rectangular box, in SSADM by an oval shaped circle. However, both of these versions can be used for data analysis that does not necessarily focus on producing software as an end objective of the analysis. Since this research did not aim to produce software, both of these versions offered potential for this research. The SSADM version was ultimately used because it was sophisticated and more suitable for organisational analysis.

DFD modelling notation

The notations associated with the SSADM version of DFD is shown in Figure 7.3. A 'data flow' is a route which enables data to travel from one point to another in the diagram. The flow is represented by an arrowed line with the arrowhead showing direction. Each flow is given a simple (but meaningful) descriptive name. Processes are transformations, changing incoming data flows into outgoing data flows. All processes are numbered to permit easy identification and cross-reference. The name of a process should describe what happens to the data as it passes through it; usually therefore, a process is an active verb. A store is a repository of data, it may be a card index, a database file or a folder in a filing cabinet. The store may contain permanent data or temporary accumulations (e.g.

daily movements). A source or sink is a person or part of an organisation which enters or receives data from the system but is considered to be outside the scope of the project (e.g. Department, employee). The source/sink may be duplicated in a completed DFD to simplify presentation. This duplication is again shown by the addition of a line within the symbol. An example of the DFD showing the use of all of these notations can be seen in Figure 7.4.

Figure 7.3. Modelling notations of DFD

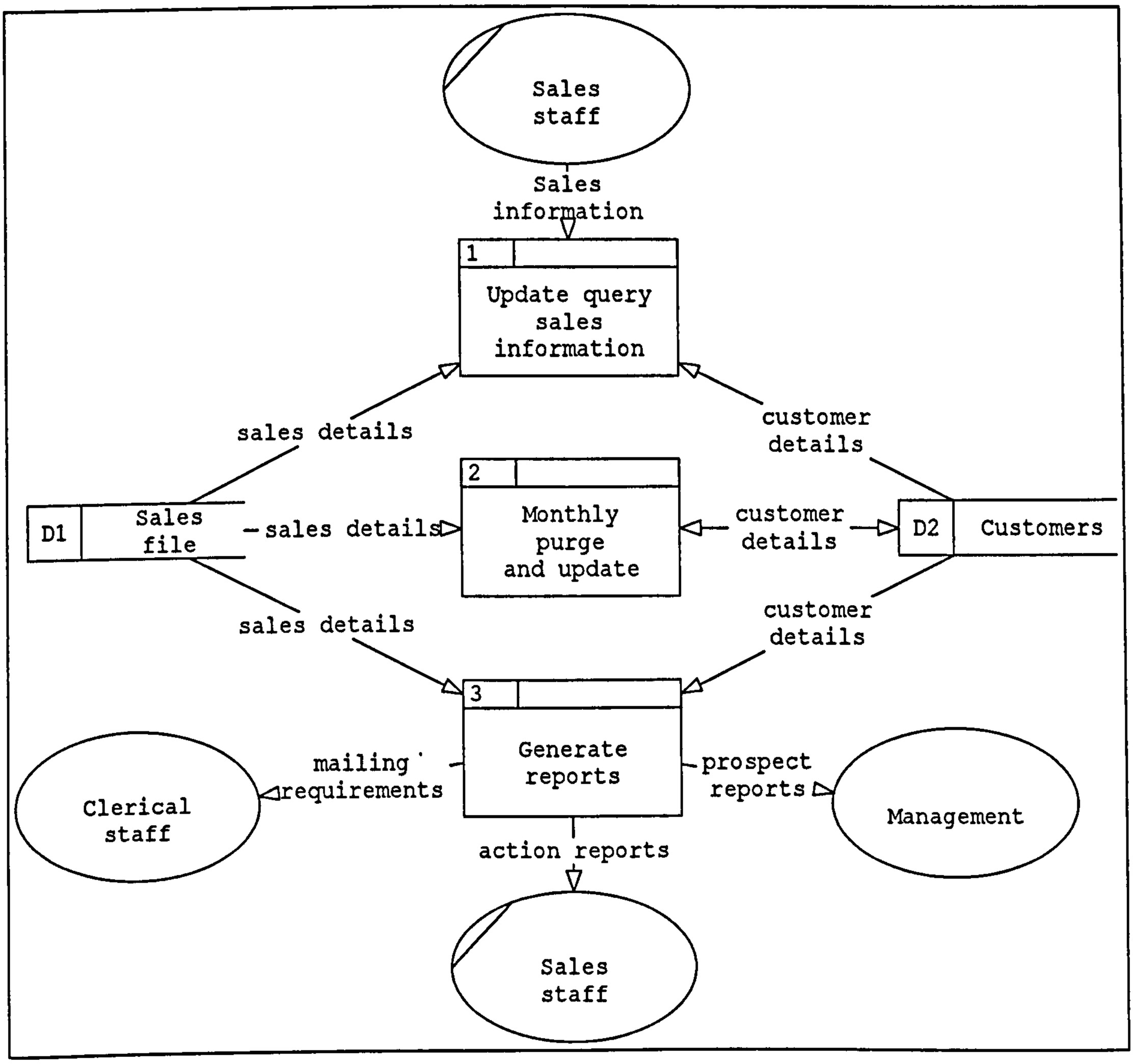


Modelling hierarchy

A DFD can be used for both top down and bottom up analyses. For example, when a system is too large to be represented by a single DFD (e.g. on a single A4 sheet) it is necessary to undertake an initial partitioning into major sub-systems. If the sub-systems are still too large then they can in turn, be divided into sub-sub-systems and so on. Using

this approach, an analyst will end up with system components that can be portrayed by simple DFDs of primitive functions (De Marco, 1979). It can also be bottom up, for instance, DFDs may be developed for three of four departments of the company and then summarised in an overall system (Skidmore, 1994). In both these cases, functional primitive diagrams are obtained and that they cannot be further decomposed. If each division of a system is partitioned into sub-systems and sub-sub-systems with a DFD for each, then a levelled set of DFDs is obtained. The top level of such a levelled set of DFDs is called the Context Diagram and the bottom level is composed of a set of unpartitioned processes called functional primitives. When a process is decomposed into lower levelled processes, the main process is called the 'parent' and each of the decomposed processes is called a 'child'. For example, in Figure 7.4, process-3 (generate reports) can be further decomposed into a 'children' to show the sub-processes involved and associated flows in generating reports (i.e.Clerical, Sales, Management). All data flows shown entering a child diagram must be represented on the parent by the same data flow into the associated process. Outputs from the child diagram must be the same as outputs from the associated parent process. This is known as balancing of DFDs.

Figure 7.4 An example of a DFD



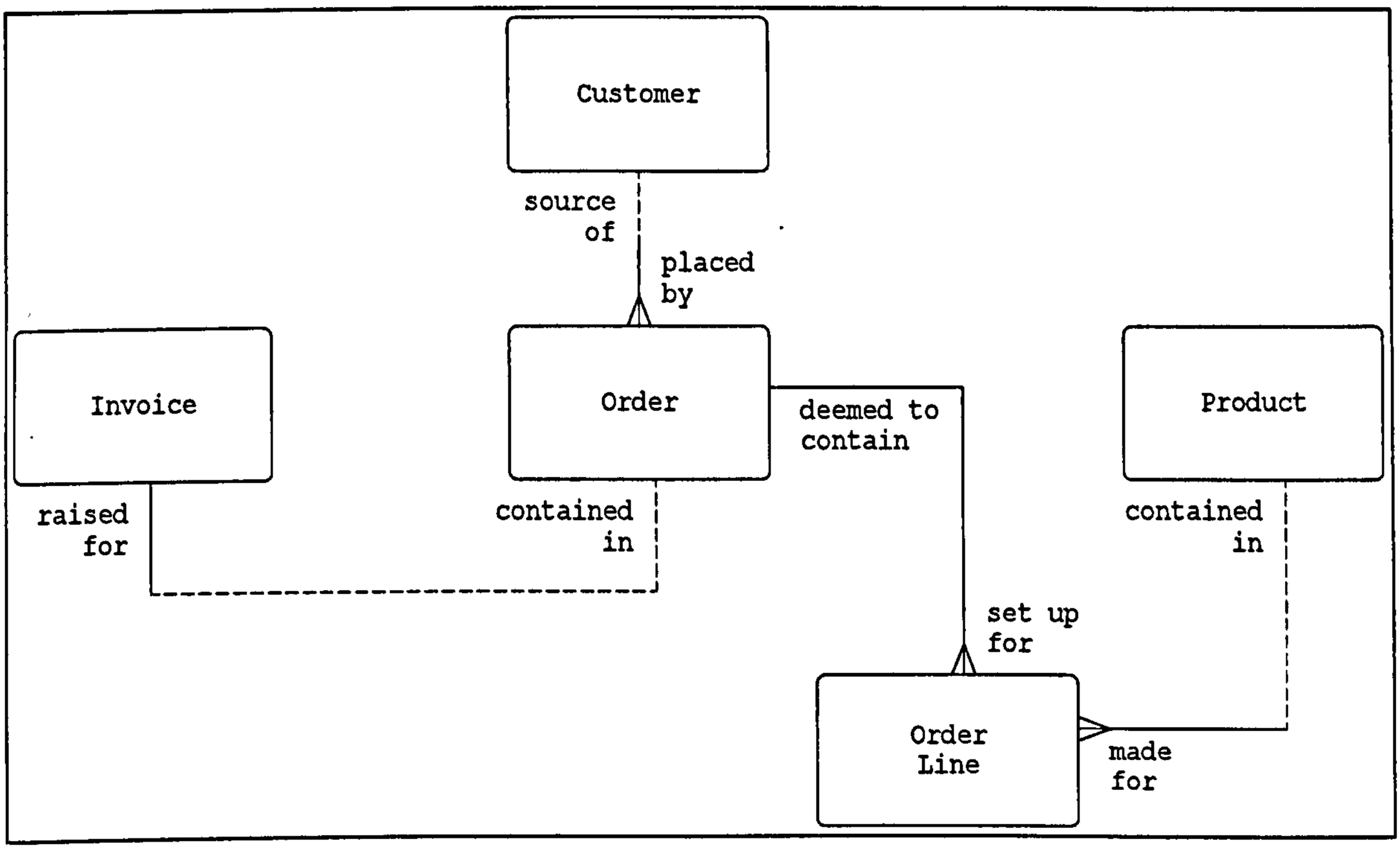
(Adopted from SSADM user's guide, 1996)

7.2.4 Data Structure models

An organisation may require a clear and accurate knowledge of the data structures underlying its information requirements whether they are computerised or not. Skidmore (1994) stated that development of data structure shows how the data is logically grouped and related in the context of the business requirements of a system. According to

Skidmore, alternative names for this data structure model include: Entity Model; Data Entity Model; and Entity Relationship Diagram. An example of a Data Structure model is shown in Figure 7.5.

Figure 7.5. An example of a Data Structure Diagram



(Adopted from Skidmore, 1994)

The Data Structure model mainly shows business connection between entities. Relationships are often of degree one to many. The many aspect of a relationship is represented by the 'crow's foot' symbol on the end of the relationship line. For example, in Figure 7.5, the relationship between the entities-Customer and Order can be read as each Customer may be a source of one or more orders and each Order must be placed by one and only one Customer. It can be seen in this figure that each process or entity will need to navigate the data structure by means of the access paths provided by the relationships. By doing this, the model establishes functional dependencies, which in turn, reflects a

business rule of the enterprise. This approach can be used to unambiguously document business system rules rather than to model the implementation of a change process that this research intended to produce. On the other hand, the DFD approach has been found most useful in analysing two or more individual companies' DFDs and abstracting from these DFDs to generate one common system, then representation of good current practice can be achieved (Fisher and Yin, 1992). Thus this research has adopted the DFD approach to model current good practice for implementing empowerment in construction organisations.

7.3 The techniques used to model the empowerment implementation process

Section 7.2, discussed some of the modelling techniques that were perceived as most relevant to this research. Overall, the DFD approach was found most appropriate in attempting to model the empowerment implementation process. This decision was reached for the following reasons:

- They are graphical, partitioned, and multi-dimensional, thereby allowing accurate analysis of very complex systems.
- DFDs efficiently map processes/activities and their linkages.
- They are user-friendly and easy to understand.
- Hierarchical modelling in DFD allows one to analyse the primitive functions of a system at more detailed level.
- Each level of a levelled DFD can be conveniently restricted to a standard A4 size paper, facilitating efficient interpretation of data.
- The components of DFDs include, processes, data flows, data stores, and sources/sinks. These are suitable for modelling efficacy-information (see Chapter 3 for efficacy information) in an empowered organisation.

- The DFD approach is a valid, proven, well established technique in the field of construction management research (Fisher and Yin, 1992; Ibbs, 1994; Hassan, 1996).

In view of the above suitable characteristics, DFD analysis was used as the main modelling technique in this research. However, as discussed earlier in this chapter, the Generic DFD that this research has produced cannot be readily applied to any one individual organisation without modifying it within the constraints of that particular organisations. This is because, previous experiences on implementation of new concepts (like TQM) have emphasised that an implementation system should be designed specifically to suit a particular organisation (i.e. the organisation who intends to implement the change) (Burati et al, 1993). Modification requires conceptual ideas of good current practices for an analyst to conduct such design. Taking this into account, this research (after developing a Generic DFD), produced a conceptual model for implementing empowerment.

To complement the GDFD, system flow chart models were also developed to: express the GDFD in a simplistic form; and show the control mechanism of the implementation system which the DFD approach fails to address. This approach has previously been used by Mann (1994) who, first produced DFDs for each organisations being studied, and then developed a conceptual model for implementing TQM in business organisations. However, Mann did not strictly follow the rules of DFD techniques. For example, the notations of both *data flow* (section 7.2.3) and *data structure* (section 7.2.4) were combined in his DFD model, which violates the rules of structured data analysis. Another mistake was that he used activity flows, in some cases, instead of data flows. This research has strictly followed the rules of DFD notation and techniques to develop a GDFD model.

7.4 Application of DFD techniques in the field of construction management

To model good current practice in construction management, Fisher and Yin (1992) emphasised the use of DFD. Fisher and Yin, using the DFD approach, produced a GDFD model of project management for construction organisations, by observing and amalgamating current systems of three leading construction organisations. They produced separate DFDs for each of the three case-study organisations, and finally produced a GDFD by combining the best practices of all three.

Research by Ibbs (1994) used DFD to describe the decisions and information transfer steps needed to develop monthly plans for installing piping systems in an industrial facility. Ibbs argued that the DFD technique can be efficiently used to reengineer a work process for continuous improvement. Hassan (1996) developed a Generic DFD model for the conceptual and schematic stages of design, who also argued that DFDs are the most suitable technique for modelling information flow within the design process. Stephenson and Oxley (1985) produced a DFD system model (including levelled models) for the construction tendering and estimating process. Barton and Heath (1985) produced a logical plant control system model using DFD, their final model (generic) was produced by studying systems of several medium sized building firms in the West Yorkshire region of Britain.

7.5 Summary

This chapter, has investigated the potential of several modelling techniques (in the light of system analysis), and finally identified the DFD approach as most suitable for: analysing the current empowerment systems of case study organisations; and producing a generic model to represent the current best practice of empowerment in construction

organisations. It has also been confirmed that the DFD is a well established technique of Structured Data Analysis (SDA), and that this approach has been well tested in the construction sector. To complement the empowerment system generated by DFD, both conceptual models and system flow chart models were determined to use in this research. The purpose of these models was to make the GDFD model more flexible enough, to be used for implementing empowerment by those construction organisations having similar characteristics to those studied in this research.

Chapter Eight

A Generic Model and Best Practice Framework for Implementing Empowerment in Construction Organisations

8.1 Introduction

This chapter is concerned with the investigation-phase (identified as Phase Three in Chapter Four). The development of a generic model for effectively implementing empowerment in construction organisations is described. For the reasons outlined in the previous chapter, the model was developed using Data Flow Diagrams (DFD), with one of the CASE (Computer Aided Software Engineering) tools named SSADM (Structured Systems Analysis and Design Methodology). Three case studies were undertaken, from which combined, evolved the Generic Data Flow Diagram (GDFD). To maintain anonymity, the case study companies were designated A, B, and C respectively. Analysis of these companies' empowerment implementation profiles classified them as being medium and above (high) in terms of using empowerment activities (see Chapter Six, Section 6.5.6). The development of the GDFD was an iterative process, where continuous feedback from informants of the case companies were sought.

As stated in Chapter Four, the qualitative data obtained from each case study were initially analysed and reported separately under the nine empowerment elements: leadership; empowerment system; resources development; involvement; education and training; teamwork; process improvement; measurement; and recognition. Further analysis of these elements led to the development of current DFDs for each of the cases. Consequently, these three DFD models were analysed in the light of the concept of empowerment and a GDFD along with a best practice framwork were produced. To facilitate application of

the GDFD model to other construction organisations (having similar characteristics), a conceptual implementation model along with a system flow chart were derived from the GDFD. Data collection methodology and its validity have already been confirmed in Chapter Four. The interview questionnaire is exhibited in Appendix C.

Validation of the model was an on going process undertaken within the development of the GDFD. As discussed earlier in Chapter Four, the concept of replication (in view of corroboration) was adopted to assess external validity. As an ultimate validation procedure, industry feedback to assess feasibility of the model are reported in the next chapter. The internal validity technique, i.e. triangulation of and convergence among different sources of information was a concurrent process undertaken continuously through four stages of investigation (including Chapters 5 and 6). However, it is collectively reported in the next chapter.

8.2 Constructing Data Flow Diagrams (DFDs)

The modelling notations and levelled systems analysis technique (hierarchical modelling) of the DFD approach have been discussed in detail earlier (Section 7.2.3) with an example of a DFD model. Constructing the DFD is an iterative process, which involves a step by step approach until the model is completed with sufficient data. Skidmore (1994) provided a set of simple guidelines to construct a DFD as follows:

Stage 1: Establish the major inputs and outputs of the system.

Establish the source of each input and the receiver (sink) of each output and make them external entities.

Stage 2: Establish a process that incorporates each input on its arrival into the system.

Establish the data stores (if any) that this process needs to create or use if it is to be successful.

Stage 3: Establish a process that generates each output flow from the system.

Establish data stores (if any) required by these processes.

Stage 4: Examine the process (es) and associated flows that link the input and output processes.

Establish the rules for these processes and expand the DFD to reflect these rules.

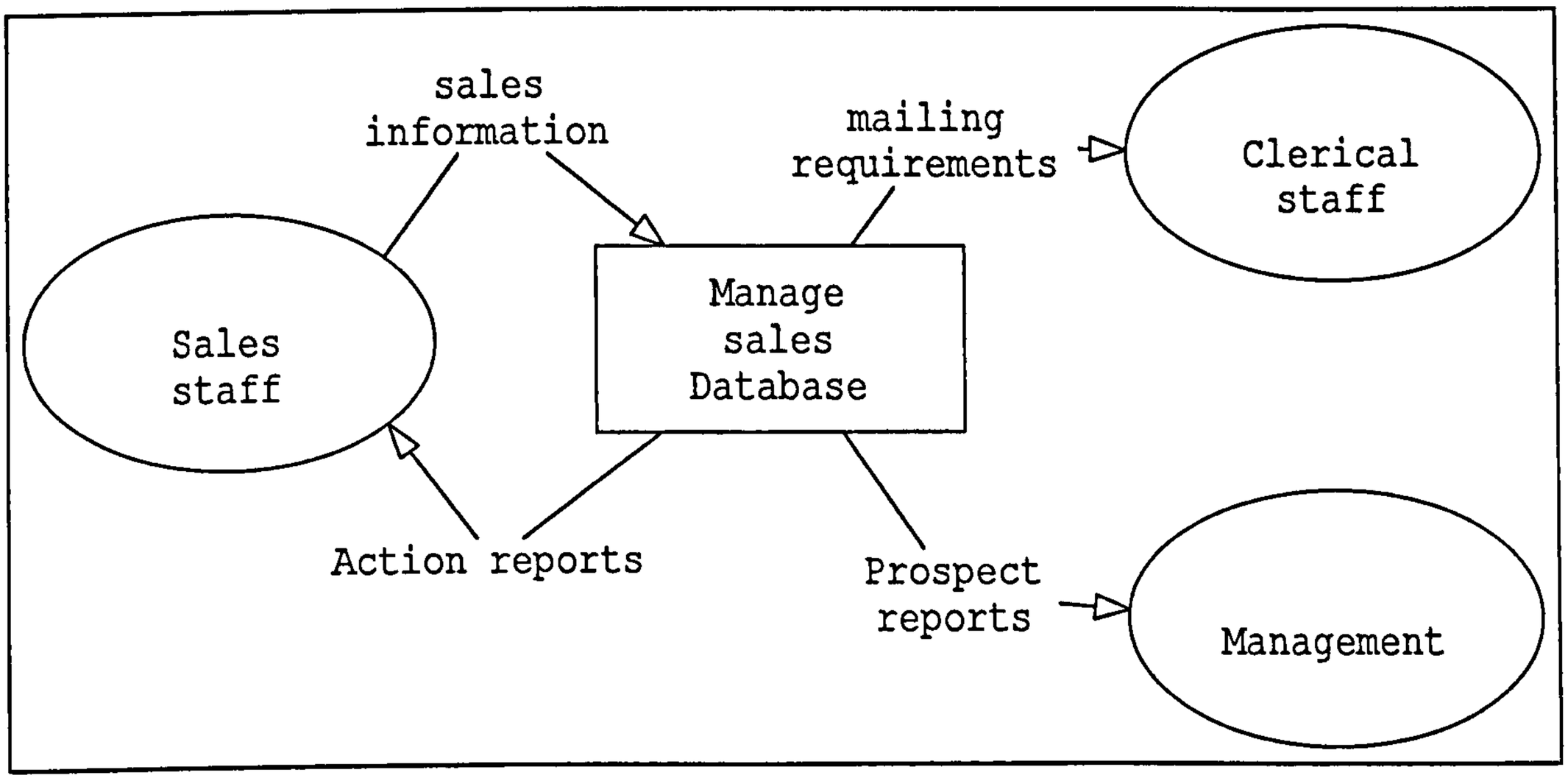
Identify other inputs and outputs required by processes.

Stage 5: Establish a hierarchical set of DFDs which reduces the number of processes in the top level diagram to a manageable number.

These steps can be better understood by referring to Figure 7.4 (previous chapter). The steps are not strict, they can be flexibly followed by concurrently addressing all stages simultaneously. This depends on the logical understanding of the analyst on problem areas that are under investigation. In the SSADM software, stage 1 yields a *Context diagram*, which is a top level DFD representing the system as a single node. This diagram shows the major inputs and outputs of data and resources across the system boundary (between the system and external entities). The context diagram for the DFD model shown in Figure 7.4 is presented in Figure 8.1. Figure 7.4 (Chapter Seven) is the Level-1 DFD that represents the decomposition of the context node; it shows the top level processes and data stores, and the flows between them. However, it is not necessary that the *Level-1 DFD* should be preceded by the context diagram. Depending on the analyst's level of understanding of the processes and their flows, the Level-1 DFD can be drawn without drawing the context DFD. Further decomposition of the Level-1 DFD yields lower level DFDs which show the system in more detail. A lower level DFD is known as a *Child*, and the individual process (of the level -1 DFD) which has become decomposed is known as

the *Parent*. This decomposition process is called 'hierarchical modelling' and has been discussed in detail in the pervious chapter.

Figure 8.1. Context diagram for DFD model shown in Figure 7.4



(Adopted from SSADM user's guide, 1996)

At any stage of the development of a DFD, the software allows the analyst to edit the DFD. For example to: add additional nodes; connect the new nodes with flows; rename a flow; change the direction of a flow; change the type of a flow; and add a process location. The software can also be used to check the DFD for consistency of processes and respective flows in hierarchies (between Parent and Child diagrams). For example, for bi-directional flows to balance correctly, the child flows must also be bi-directions and have the same name as the parent.

In short, construction of a DFD requires complete description of all of the relevant information about the system, from which, processes that constitute the system and their respective incoming and outgoing flows and sources or sinks for those flows can be easily

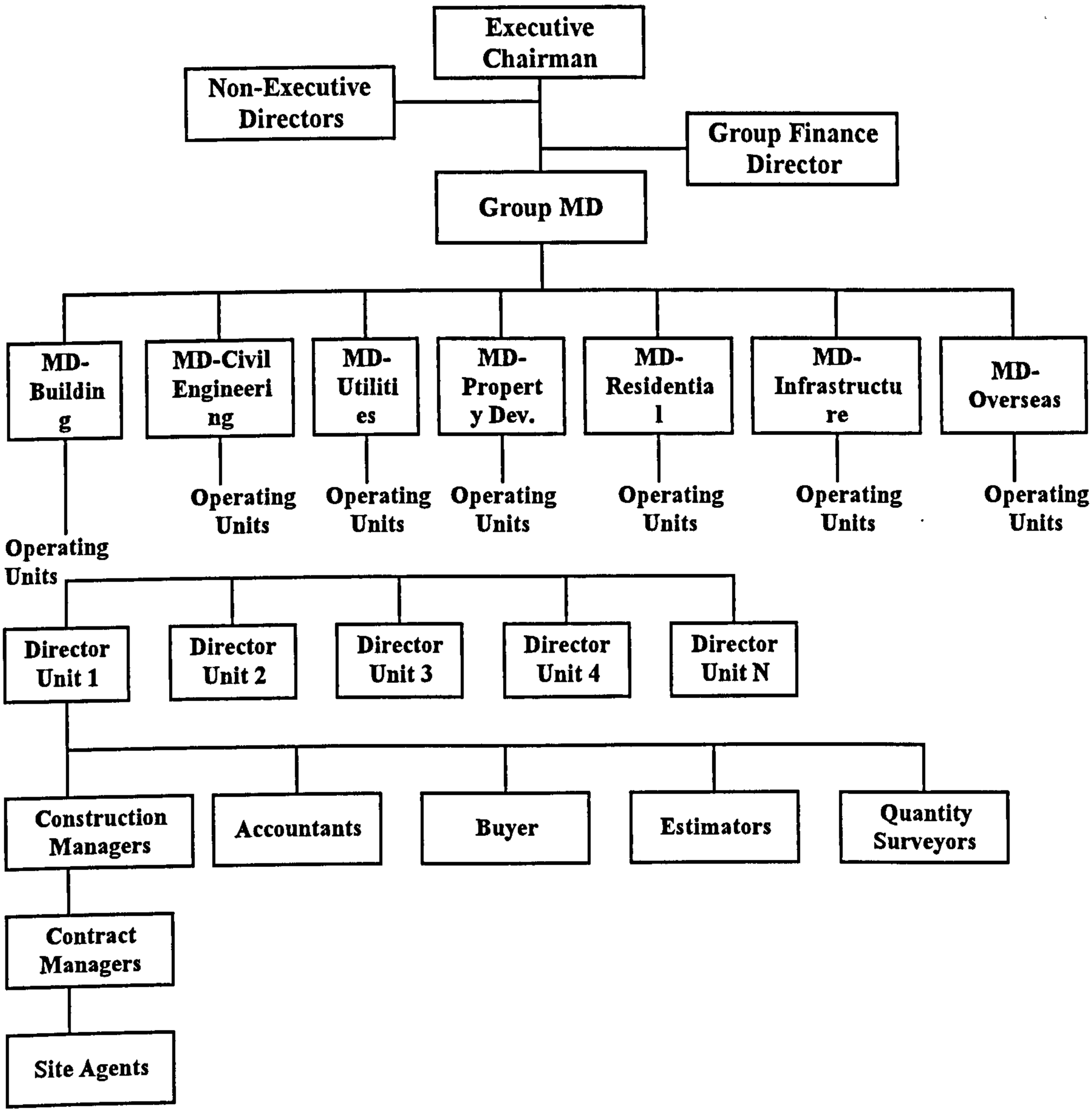
identified. In order to achieve this, initially, data obtained from each of the case companies are described in detail under the nine elements (units) of analysis (identified in an earlier stage of this research): leadership; empowerment system; resources development; involvement; education and training; teamwork; process improvement; measurement; and recognition.

8.3 Case study 1: Empowerment implementation in Company-A

Company-A is a major construction organisation operating throughout the UK and in selected overseas markets, predominantly involved in Building and Civil Engineering. Their overseas presence includes: Petersburgh, Azerbaijan, Gana, Berlin, and the Middle East. The group has seven major divisions: Building; Civil Engineering; Utilities, Energy and Plant, and Transport; Property development; Residential development; Infrastructure development; and Overseas (Building and Civil Engineering). A number of operating units are working under each divisions (see Figure 8.2). The company employs approximately 1800 people, and has continually increased its turnover since 1990 as follows:

Year	*Turnover in millions(£)*
1990	156
1992	190
1993	208
1994	220
1995	218

Figure 8.2. The organisational structure of Company-A



8.3.1 Organisation and company policies

Management structure of company A can be grouped under three major levels of hierarchy: senior management (the Main Board); middle level (Operational); and direct work (site level). The Main Board includes an Executive Chairman, Group Finance Director, Group Managing Director, three Non-executive Directors, and seven Divisional Managing Directors. The Non-executive Directors are independent of management and

free from any current direct business or other relationship with the Group. The Main Board meets on a regular basis and retains full and effective control of the Group. Group performance and strategic objectives are established by the Group Board.

Operational Units, comprise Regional Directors and Local Management Board, operating with maximum possible financial and managerial independence and scope for decision making. They report monthly to respective Divisional MD's and ultimately the Group Board. The Local Management Board comprises a Regional Director plus senior managers of the main functions - typically, construction, estimating, finance, and commercial/marketing. Each Unit, besides the general management of projects, is responsible for identifying those projects which represent significant risk to its profitability and for taking appropriate steps to address these risks. At Group level, significant individual projects/contracts are separately identified and monitored at monthly risk management meetings. In turn, action priorities at Group level in regard to these risks are agreed. Internal audits carry out an agreed programme of work including testing of compliance with Group operating procedures, through visits to all significant Operating Units on an annual basis.

The Direct Work level comprises, predominantly, Site Agents and very few weekly paid operatives (at some sites), involved in the day-to-day operations at construction sites. Mostly, works are sublet to Sub-contractors.

Company policies

Three major policies of the company centre around: employee involvement, health and safety, and quality. Employee involvement in the business is considered of prime importance for improving the business. The company is fully committed to the training and development of all employees and involving them in the development of the business

and all matters which affect their work. This was achieved primarily through a policy of communicating and consulting with employees by a variety of means including regular Group publications, monthly briefing sessions and other periodic announcements. In addition, copies of the Annual Report are available to all employees on request. In February 1995, the Group was one of the first UK construction companies to achieve the award of "Investors in People" for all of its operations throughout the UK.

It is Group policy that its operations are executed at all times in such a way as to ensure, so far as is reasonably practicable, the health, safety, and welfare of all its employees and all other persons likely to be affected by its operations including sub-contractors and the public at large and to provide the necessary training and information to make this policy effective. Internal safety inspections and audits by the Group's own safety specialists are carried out on a regular basis. In addition, substantial training is given to employees and others in all aspects of safety.

8.3.2 Background to empowerment and quality in Company-A

Since 1985, Company-A has progressed through many steps to achieve quality in construction: Quality Built In; Quality Circles; Quality Assurance (BS 5750); and Total Quality Management. During 1985, the company used 'Quality Built In' signs on its construction sites. Despite some improvements (in performance), the management believed that there was a need for something to be done beyond slogans to improve further the quality of its performance. Consequently, a number of initiatives, including Quality Circles and Quality Assurance were undertaken to establish quality at work sites. The philosophies adopted in these initiatives have been, for instance, "inspectors inspecting in quality" in Quality Circles, and "managers ensuring compliance with approved systems and procedures" in Quality Assurance. Company-A's quality definition

was that, "quality describes a product or performance level which complies with a specification agreed between customer and supplier". However, the company could not achieve this definition despite the above quality initiatives, and it realised that individuals should be involved in the business to achieve quality, which culminated in the implementation of Total Quality Management (TQM) during the year 1990. The company's approach to TQM is "*individuals having ownership of quality*". The Total Quality objective of the company is *"delighting the customer at the lowest cost through harnessing the involvement of every employee".*

The main aim of TQM implementation was to improve financial performance of the business and customer satisfaction, by involving employees in the business. Consequently, the company has empowered employees to take their own decisions, at their own business level/process, to deliver high quality product/performance to the customer at the lowest cost. Other reasons for the implementation of empowerment have been: to offset threats from competitors; use of manpower for process improvement; and on the advice of consultants. Thus, the employee empowerment programme began as part of TQM. Since TQM provided the necessary environment to focus on customer, employees, process and training, it was realised that empowerment could best be operated within the context of TQM.

8.3.3 Empowerment implementation in Company-A

8.3.3.1 Leadership

Top management of the company realised that it must become 'cheer leaders' and motivators to support the empowerment process, and also encouraged leadership at all levels of the organisation, including direct work level. Their leadership strategy was

'participative', i.e., managers and superiors at all levels of the organisation should act as leaders and encourage, facilitate, and motivate employees to improve their business processes by involving them in those processes. Almost all levels of the organisation, (including departments, sections, several teams and sites) have their own leaders, whose roles are described below.

Senior management

The empowerment programme was led by the Group Steering Committee, which comprised the Chairman, Directors of the Main Board, and Divisional Managing Directors. It should be noted that most of the Divisional Directors are also the Directors of the Main Board. Similarly, divisional level Steering Committees were also set. Both the Group and Divisional Steering Committees were a permanent top level management team, whose main leadership roles were to: develop the vision and strategic policies to achieve that vision; and continuously show commitment by acting as role models and champions of empowerment for employees to follow. The Group Steering Committee was chaired by the Chairman and the Division by the Divisional MD.

The Main Board (Group Steering Committee) has developed the group wide vision that:*"we aim to be the best in the business through the strongest commitment to quality and customer service"*. To enforce this vision, a workshop was conducted. In addition to the Board, approximately 15 other employees of both the divisional senior management and lower levels attended the workshop, after which, they agreed on the above vision. By incorporating lower level employees in producing the highest strategic level direction, the company has achieved employee involvement at a very early stage of the empowerment process. Similarly, each division has its own sub-vision statement (to help achieve the overall group vision), which was produced by both the senior management of the division and ten other selected employees across the whole division. The main contents of these

sub-vision statements include: customer relations and market; employee improvement; waste minimisation; and cost reduction. After agreement of this vision statement, it was distributed to the entire organisation through various channels: local memos addressed to each and every individual; notice boards; and monthly team briefings. Feedback was requested from all employees, and where necessary corrective actions were taken. For instance, those who did not understand the statement had it clarified by top management. Employees were also encouraged to feedback with new ideas on how to achieve the vision. Since the vision development involved employees across the organisation, there were little criticism of it.

The Group Board then produced an appropriate policy in line with the vision; and provided appropriate environment and resources (finance, equipment, training, and contact with other organisations) to implement empowerment. (These are discussed in detail in subsequent sections). This included senior management including the Chairman walking through departments and sites to discuss with employees their problems, improvements, and so on. These actions showed continuous commitment on the achievement of the vision.

Leaderships at lower levels

The company's leadership strategy was to encourage all employees to become leaders. It was realised that without being effective leaders, employees could not manage their own processes. Consequently, employees were trained to act as leaders. The leadership training skills offered were: communication, quality, motivation, decision making, and planning. Contents of the leadership skills in general, were perceived as being similar at all levels of the hierarchy. However, the degree of required skills varied with respect to the organisational levels.

Based on job functions leaders were assigned at both operational and direct-work levels. Local Directors of the operating units became leaders to direct the units, and Construction Managers/Contract managers became leaders at site level. Besides these functional leaderships, leaders were assigned to Task teams which were established to manage or solve specific tasks. These leaders could be at any level, for instance, at site level, a Site Engineer became leader of the Task team where the senior Construction Manager was a member of that team. At operative level, Foremen or Site Agents became leaders of work teams. However, the company has a negligible number of direct work operatives. In this case, leaders of the sub-contractor operatives became members of the site level teams. These leaders act as "Action Centred Leaders", who envision what factors need to be addressed to be effective, and further actions needed to achieve those factors effectively.

8.3.3.2 Empowerment system

The Group Steering committee meets once in four months to discuss policy, progress, new directions, and process improvements. This high level committee established the empowerment policy as part of the quality policy and sought feedback on it from Divisional Boards. Initially, external consultants were appointed to assist in the development of the policy. There were no problems encountered with consultants not understanding the business functions. Finally, all employees were informed of the revised policy by publications, team briefings, and notice boards. There was an overwhelming positive response from employees, however, some little indifferences and scepticism were identified. These problems were solved by subsequent education, awareness, and publications.

An implementation plan was developed by six Directors of the Group Steering Committee plus three external consultants over a period of six months. This included the involvement

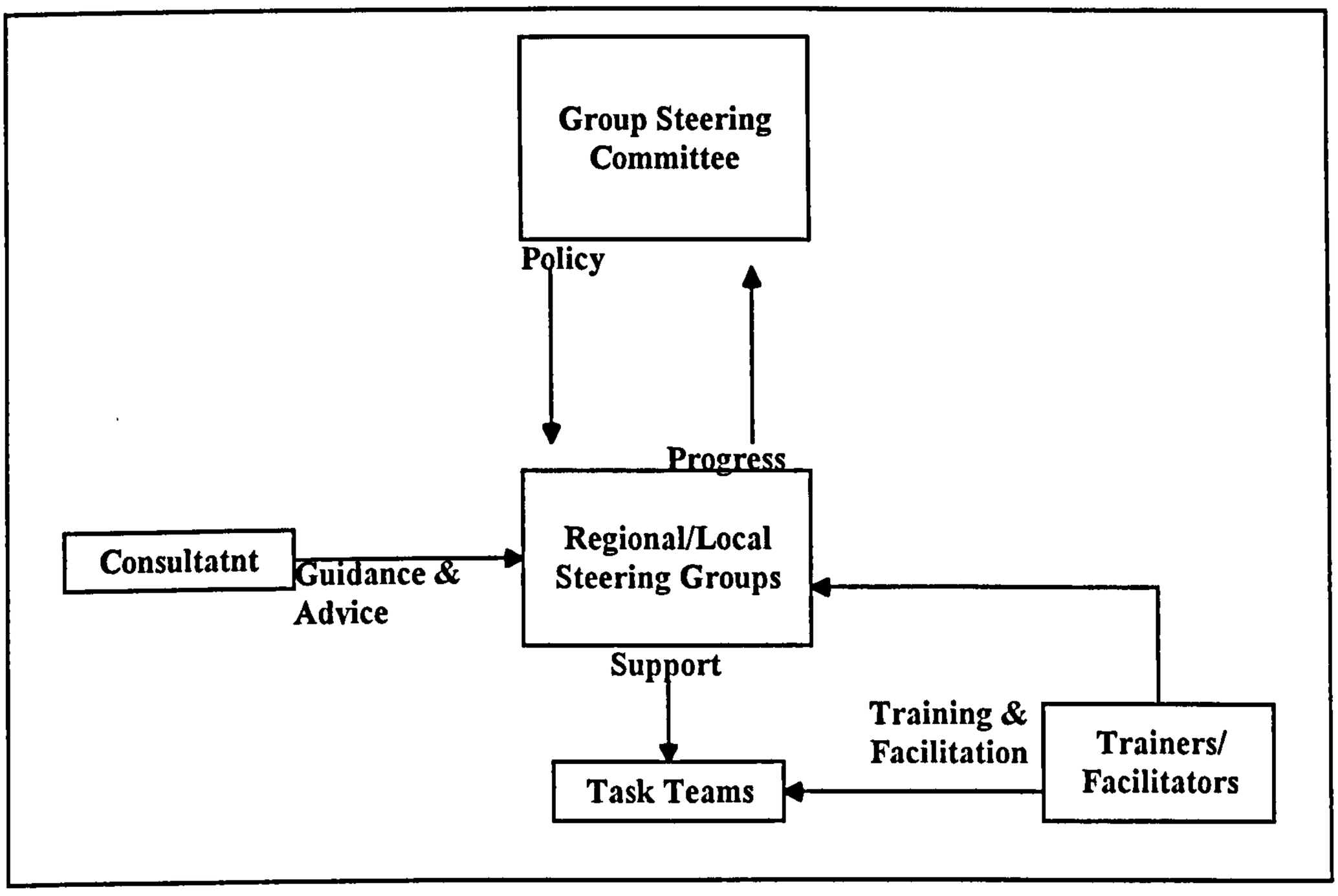
of Divisional Directors and other senior management personnel for the improvement of the plan. As part of the implementation plan, procedures and roles were established to undertake different tasks required for the implementation. Roles were designed to enhance the flexibility of employees working as teams.

Initially, the implementation began with several workshops called "Information sessions" conducted in three stages; first at senior management level, second middle level, and third at site level. Matters discussed during these sessions included: the quality and empowerment policy; TQM, employees' involvement etc. Cartoon booklets explaining the main elements of TQM and empowerment were issued to everyone to make them understand the implementation approach.

Each division was granted autonomy to decide on implementing empowerment within their division; they were allowed to form their own Steering Committees called Regional Steering Groups (see Figure 8.3). Several Task Teams were set up to function under each Regional Steering Group to address different delegated tasks of the empowerment implementation. All Regional Groups and Task teams were backed up with trainers and consultants to facilitate the implementation process. Group Board Directors and Divisional Directors were trained as consultants to offer advice and guidance on empowerment. Local (operational units) senior and middle line managers (volunteers) were trained as Trainers to provide training to, and facilitate the work of, Task Teams.

Currently, all divisions have implemented empowerment, and approximately hundred per cent of employees are aware of empowerment and 90 per cent understand the concept.

Figure 8.3 : Empowerment Organisation



8.3.3.3 Resources development

The main resources that the company prioritised as necessary for implementation of empowerment are: clear objectives; commitment and involvement; willingness to adopt new ideas; employee development; fund; working conditions; organisational structure; and management style. The Group Steering Committee was responsible for developing all of these resources and members of the Steering Committee met to discuss as to how to effectively provide them.

Restructuring

Restructuring of both the organisation and business processes were ongoing, based on needs, when raised. Based on improvements identified by employees, restructuring of

either the organisation (including departments, sections) or processes were undertaken at appropriate levels.

The organisation was reengineered in two perspectives. First, changes in the market were addressed including entry into new markets, new types of projects such as design and construct, management contracting etc. Secondly, organisational changes sought by the implementation of TQM and empowerment such as teamwork, cross-functional process improvement, customer needs etc., were reengineered. Since the organisation has been under constant restructuring since the middle of 1980s when it started to implement quality management, there were no dramatic changes made at the time of implementing empowerment (i.e. the organisational structure was compatible to empowerment). During the reengineering process, employees of lower levels were sought for their suggestions for improvement. The reengineering plan (if any) and its implementation progress were reported to employees at every stage.

Working conditions

The main resources that were developed to improve working conditions had been: upgraded accommodation and offices; computers; and site safety. All these resources were mainly identified by local senior managers and staff (Operational unit level) and reported to the Operational Director or the Group Board.

Computer oriented information technology was implemented throughout the organisation. The system was mainly designed and implemented by the in-house specialist task teams with the advice of external consultants. As part of working environment improvement, sites and offices were also redesigned at some parts of the organisation. This also improved communications. A site safety department, provided with Safety Advisors, was

established at all sites. Posters outlining group safety policy and safety activities were posted at main places of the site.

Funds

The main source for investment of the above resources were in-house, and were estimated by the Finance Department at both operating level and Group level. Depending on the cost of the proposal either the Operating Director or the Group Board sanctioned the proposal. Funds were also allocated to departments or individuals to use for business related improvement activities (e.g. visits to customer) without approval by top management. For instance, in dealing with a major material supplier, the buyer at operating level can purchase without approval by top management.

8.3.3.4 Involvement

The company used a strategy of "voluntary participation" to involve all participants including, their own employees and external participants such as customers, suppliers and sub-contractors. Experience identified this as key to the successful implementation of empowerment.

Employee involvement

Each division of the company was provided autonomy to decide on their own to participate in the empowerment programme. Initially, the "Homes division" started implementation in 1990, at the same time two other divisions expressed willingness to participate in empowerment. Similarly, within the divisions, employees were left with options to participate. The management inspired employees to adopt empowerment.

Initially, several information sessions were conducted at both group and divisional levels to make employees aware of empowerment and its potential benefits for performance improvement. The Group Steering Committee and Divisional Steering Committees were responsible for conducting these sessions at their own levels respectively. All divisions were encouraged to take initiatives within their divisions themselves, however, the Group Steering Committee provided all necessary resources and expertise to the implementation process. Based on the willingness of divisions several Regional steering Committees were then established in each division. The roles of these committees have been discussed in Section 8.3.3.2. The Quality College Manager monitored progress of involvement activities by the use of questionnaire surveys (known as 'Quarterly Staff Attitude Surveys'), and reported to the Group Steering Committee which in turn disseminated findings to divisional/regional level management and employees. The survey requested information on grievances and employee satisfaction. Grievances relating to the job and personal attitudes were also encouraged to be reported via informal talks with immediate superiors. Once grievances are received, the immediate supervisor was obliged to rectify them immediately, if beyond the decision of a particular supervisor, then they were passed on to top management. The survey results of employee involvement and attitude towards the empowerment programme were reported to the whole organisation, via publications, celebrations etc., so that all employees were encouraged to participate in the programme.

Customer involvement

A list of permanent customers was maintained and constantly updated. Those customers in the list were continuously kept informed of recent developments and implementation of new management strategies. This was performed through several means of communication including meetings, publications, and negotiated contracts. Involvement of customers was accomplished by means of seeking their comments on empowerment activities, questionnaire surveys seeking their expectations and levels of satisfaction on the

company's performance. In connection with this process, several visits were also made to customer premises and meetings held to discuss the improvement activities. All of the above were performed by both the Group and Regional management boards, and results reported to both employees and departments. This enabled the whole organisation to continuously be informed of customers' expectations and satisfaction.

Suppliers and sub-contractors involvement

Similar to customers' involvement, a list of favourable suppliers and sub-contractors was also maintained. Since most of the site activities were controlled by sub-contractors and suppliers, they were treated as the greatest asset for improvement of performance at site level. Unlike customers' involvement, they were involved through various forms including informal involvement in day-to-day business activities, training, and meetings. The decision of empowerment implementation was immediately communicated to them once it was decided, however, it was not insisted to implement within their own organisations. Interested parties were assisted to implement empowerment within their organisation, by training on TQM and empowerment, and solving business problems. In some operating units, interested suppliers and sub-contractors were made part of the task teams. They were invited to participate in workshops, conferences, and meetings. Through meetings, letters and surveys, expectations and satisfaction of both the company and suppliers were assessed periodically. Suppliers were also assessed on their capability to deliver quality products/service by informal means of assessment and through a Quality Assurance system (in the Civil Engineering division only). All of the above dealings with suppliers and sub-contractors were performed by both the Group and Regional management boards.

8.3.3.5 Education and training

Once the vision, quality and empowerment policy, and employee awareness subsequent involvement were achieved, the next step was to educate and train employees on empowerment and related skills required to perform their business activities efficiently. Major training strategies of the company have been activity-based and potential-based. *Potential* means, potential of somebody in the organisation having knowledge on one or more areas to offer that knowledge to others. This process improves others to be trained on multi-skills.

Primarily, training was offered by a 'Quality College' comprised of the Group Steering Committee, 22 line managers based at operating units and the Quality College Manager. Consultants were used at the initial stage for advice and preparation of training modules. Members of the Quality College received training on general issues such as TQM, empowerment, and problem solving techniques. Training departments were established at each of the operational units, and provided with leaders (Training Managers). These training departments were responsible for offering training to employees. Some of the members of these departments simultaneously act as members of the Quality College.

These training sessions usually spanned half to one full day. Besides this, display boards, news letters, and briefings were also used to make employees aware of empowerment. Usually, the Quality College Manager and Regional training department were responsible for these activities.

The training process did not preclude anyone; employees at all levels of the organisation (including the Chairman) received training. The following were the key areas on which employees of different categories were trained:

- Senior management: risk management, regulations, and leadership.
- Middle management: leadership, safety, statutory requirements, regulations, business development, and staff development.
- Direct work: process improvement, problem solving, and leadership. It should be noted that the company has a negligible number of direct work operatives.

The training process

The training process was mainly controlled and monitored through two key activities: an annual appraisal system and personnel development folders. The system sought to identify training needs of every individual using individual records for each employee and historical training records. Progress was monitored by means of a 'personnel development folder' for each employee. These personnel development folders were maintained by immediate supervisors.

Initially, individuals' training needs were identified by their superiors (with the assistance of individuals), and accordingly, training offered to them at their respective job site. Depending upon the need, either the line manager or any other suitable individual (and the Training department) offered training. Annually, individuals' appraisals and training needs, as identified at various levels of the Regional operating unit, were submitted to regional training department, based on which training topics and schedules were set by the Training department. Copies of training plans, including names of individuals and their respective training modules, were personally notified to particular individuals in advance. These copies were also displayed on notice boards. Based on individuals' needs and respective modules, either group training or individual training were offered. However, group training was preferred, because different ideas could be shared among employees and also it was found cost effective. Learned skills were followed up and monitored through the personnel development folder. On-the-job assessments were also performed by immediate

supervisors and training managers. Assessment results were distributed to the local management board (Regional Steering Committee). Based on these assessments the training process was repeated again and it became cyclic. Finally, employees who have acquired sufficient skills were certified by the training department as to have achieved competence to manage their own process.

After the certification, employees were required to manage their learning continuously in conjunction with the training department of every operational unit and the line management. This included: identifying training needs; learning from colleagues; and seeking the assistance of the training department. These were very informal.

Sometimes suppliers and sub-contractors were also given training on empowerment and quality related matters based on request. The Quality College Manager was responsible for this training.

8.3.3.6 Teamwork

Teamwork was adopted at all levels of the organisation. Teams at top level included: steering committees; remuneration committees; and a safety committee. Members of these teams were senior staff drawn from both group and divisional levels. These teams were permanent, and the team size was approximately six selected according to relevant expertise. However, team membership was very flexible; a member of one has also participated in others. For instance, some members of the steering team such as the Chairman and some divisional Managing Directors were also serving in the remuneration team. All of these teams have their own leaders; mostly being senior staff. Team meetings were conducted periodically, and at every meeting, members jointly produced an agenda

and sought inputs from all for improvement. These included discussion on several issues, including problems identified, solutions implemented, and further improvement activities.

At both middle level and direct work level, teams were formed based on functional and cross-functional business activities. For business functions such as estimating, finance, buying, and construction sites several teams were formed. These teams were also flexible, and the membership varied depending on the volume of work load and geographical dispersion. At middle level, a senior person took the lead, whereas at site level, site agents or foremen became leaders. Sometimes, they were also elected by members; here leaders were not necessarily the site agent or foreman, but may be some other operative or individuals from subcontractors. For example, at one of the sites, the construction manager in a task team was led by a junior manager. The leadership role included: team building; conducting meetings; control of team activities; co-ordination; and assisting members to solve problems or arrive at solutions. Depending on the problems identified, these teams set both long term and short term improvement goals, and accordingly produced action plans. All these teams reported to line management; for instance, teams of the middle level reported to the main board, and the site level teams reported to their superior. Depending up on the problem, task teams comprised of both management and labour, and were also established at site level including supervisors, site agents, and operatives. The working procedure of these teams were similar to that of the above. These teams were set to address specific problems such as rework, waste etc. Teamwork, in general, was adopted informally.

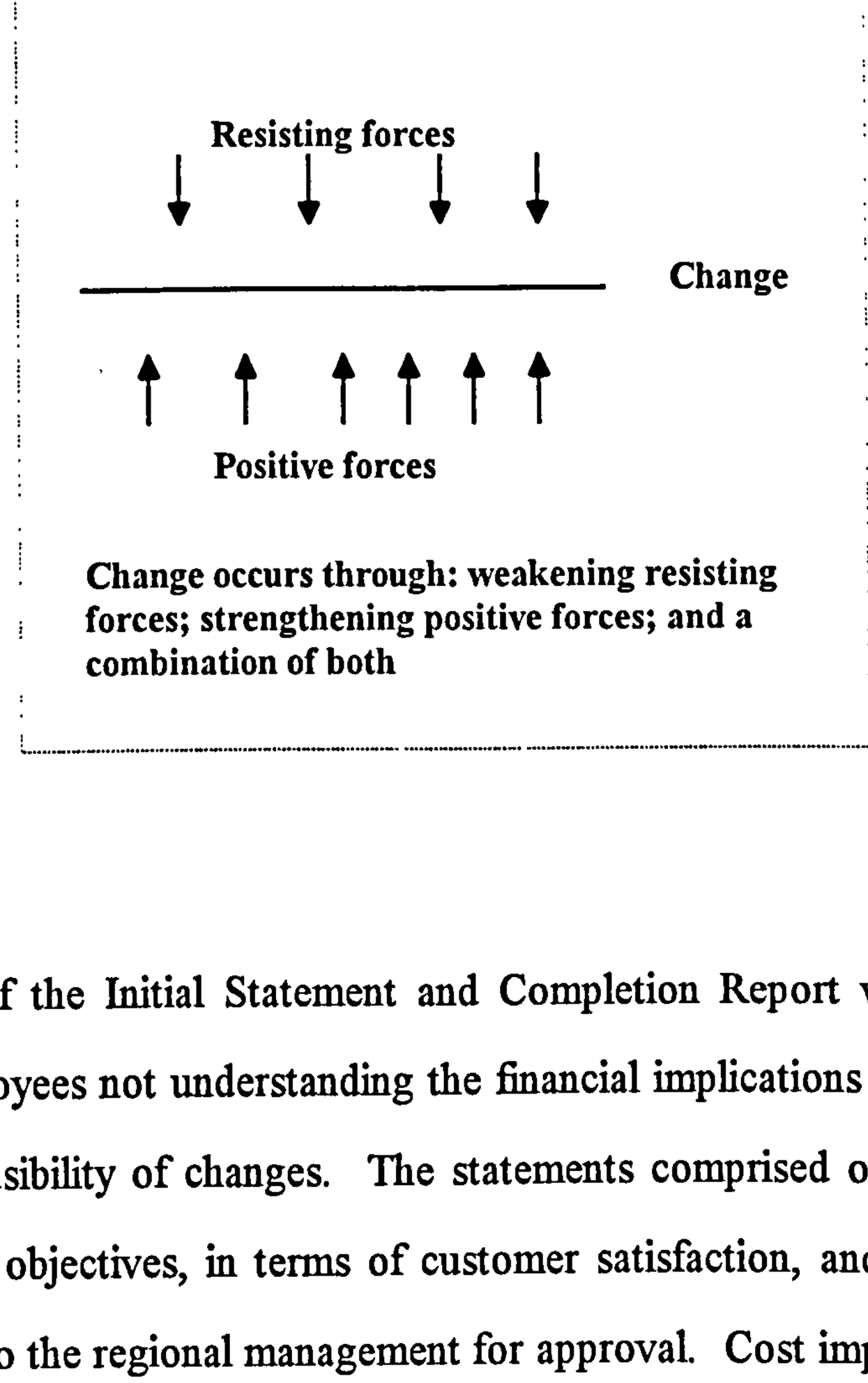
8.3.3.7 Process improvement

Owners for each process were identified depending upon the variability of inputs sought by the process. For instance, processes that did not require much input were assigned for

individual's ownership, and processes that involved interdisciplinary functions were assigned to teams. Management did not put any limit or restrictions to owners taking decisions on their processes. However, owners were limited to only take decisions for improvement of their own processes (i.e. must not affect others' processes). In teams' ownership, the limits and extent of authority to act were set by the team itself. Team process owners met everyday morning before work started, and discussed issues for improvement. Superiors at all levels of the organisation assisted owners to solve their problems and subsequently approved the new proposals.

Any changes in the business process were evaluated and subsequent proposals with cost benefit analysis were submitted to line management in the form of two reports; 'initial statement' and 'completion report'. The tools used to evaluate processes included: brainstorming; cause and effect analysis; force-field analysis (see Figure 8.4); flow charts; effective meetings and presentations. The main role of management in the process evaluation was to offer necessary resources and advise how to get problems solved by owners. Depending up on the nature of the problem, individuals from lower levels were also incorporated at higher levels to solve higher level problems.

Figure 8.4. Force field analysis



The objectives of the Initial Statement and Completion Report were to overcome the problem of employees not understanding the financial implications of their decisions, and to ensure the feasibility of changes. The statements comprised of their decisions along with measurable objectives, in terms of customer satisfaction, and cost benefit analyses were submitted to the regional management for approval. Cost implications were worked out with the assistance of Accountants. Then, the final proposal was passed on to the regional senior management for approval. After implementation of the approved proposal, the implementation process that was undertaken and consequent benefits (cost) perceived

were analysed and reported to the local senior management as a 'Completion report' (see Figure 8.5). This exercise applied to all employees of the organisation, however, at site levels, these were performed with the assistance of immediate supervisors.

Figure 8.5. Completion Report

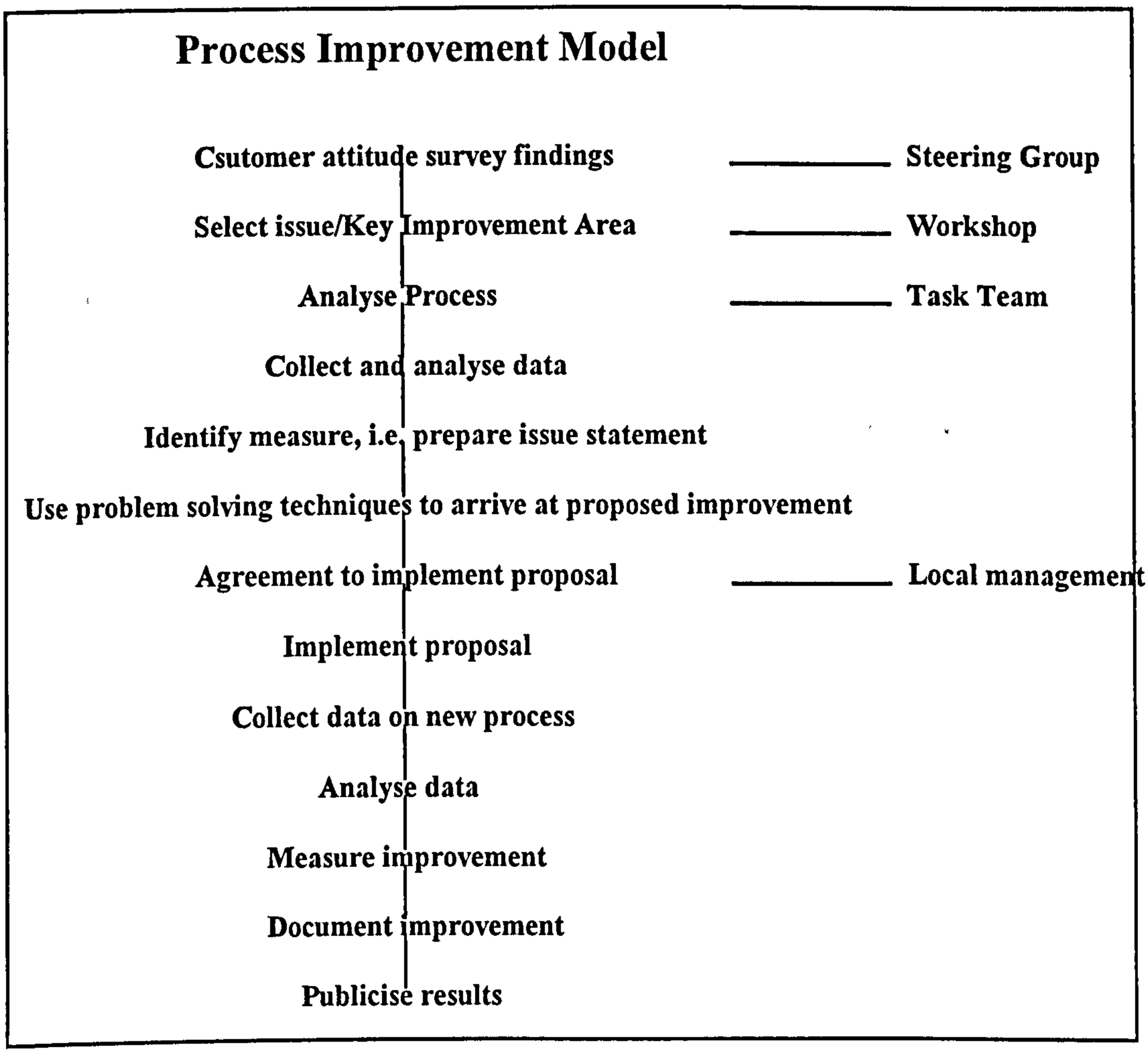
Task Team Leader:	**Start Date:**	**Completion Date:**
Task Team Members:		**Operating Unit:**
Improvement implemented:		
Measures used and quantification of improvement:		
Any lessons on process for passing on to the Quality College to help other Task Teams:		

Both the Group Steering Committee and Regional management team produced improvement plans to improve the overall performance of the company. The Regional Director plus the Regional management team produced improvement plans within their unit, and submitted them to the Group Steering Committee for approval. Depending up on the need, the regional management team established task teams (or identified suitable individuals), and supported them to implement the improvement activities, and continuously monitored progress. Similarly, site level improvement plans, including improvement of working standards, reduction of waste and so on, were also established by

regional management, and accordingly, tasks teams comprised of both management and direct work employees (for implementing the plans). A summary of the process improvement approach can be seen in the company's generic model for process improvement, which, in general, describes the approach to improve processes including the roles of various parties in the organisation (see Figure 8.6). The figure shows that all levels of the organisation were involved in improving the process. The Group Steering Committee was involved in identifying the key areas for improvements and selected task teams to analyse the respective areas (processes) and proposed solutions for change. For example, one of the key areas identified by the steering group for improvements was customers' complaints. This problem was assigned to a task team to explore how to reduce complaints. Consequently, the task team identified that 15% of sales invoices were queried by customers. This was subsequently reduced to less than 1%. This proposal was then passed on to the regional management (operational units) for implementation. Finally, employees related to the concern issue within the regional department took the responsibility for implementing the proposal for improvement. This is an example of a group level initiative. However, the same principle was adopted for individual-level and team-level process improvement.

In essence, the Steering Committees and Tasks teams worked in six steps for business improvements (see Figure 8.7). Step-1 was to gather facts by conducting a survey and analysing previous performances. Regular surveys were carried out with customers to find out which of the products and services were of importance to them. Employees were surveyed with regard to job interest, motivation, attitudes and work environment. A cost of waste calculation was carried out by the finance department to ascertain areas where money was being spent unnecessarily. These surveys identified where improvements were needed.

Figure 8.6. Process improvement model of Company-A

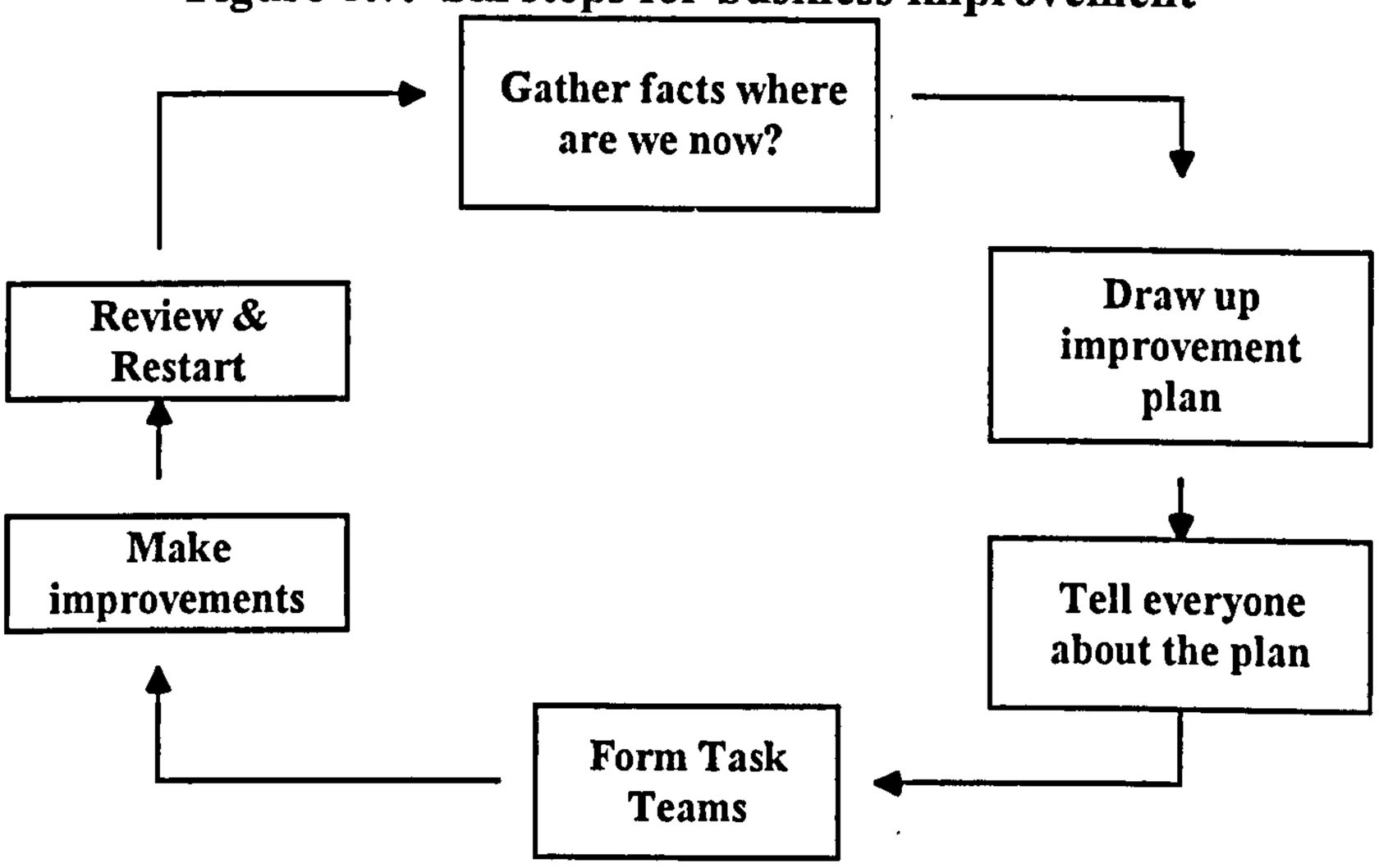


Step-2 was to draw up improvement plans produced by both senior management (including the Steering Committees) and Task Teams. Then, in step-3, everyone in the organisation was informed of the problems identified and the solutions produced. Task teams were organised with members selected based on the key improvement areas to be tackled and their knowledge, and interests. Then, the Task team devised improvement plans that were approved by the Group Steering Committee. These plans were distributed to Regional Steering Committee for implementation. Annually, the implementation efforts were reviewed, and lessons learned were presented to the Steering Committee. New

improvement areas were set again and continuously progressed through the six steps process.

This six step process is applicable to all kinds of teams including individuals at sites. After gaining sufficient training on managing their own processes employees were allowed to execute the six steps to identify and improve processes themselves.

Figure 8.7. Six steps for business improvement



8.3.3.8 Measurement

A formal measurement system was maintained throughout the organisation for assessment of performance improvement. Both company-level and individual performance measurements have been discussed in previous sections, which included: quarterly staff assessment survey (used to produce annual survey report) and personnel development folders to assess performance of individuals.

Components of the measurement system included: employee attitudes; target zero; waste efficiency; work won on value criteria; return on capital employed; training and development; safety; customer satisfaction; and profitability. These components were identified as best performance indicators for construction organisations by conducting bench marking studies on best in class companies. The Group Steering Committee was responsible for this study, and produced a measurement chart called a "Balanced Business Scorecard" to evaluate the performance of the whole organisation (see Figure 8.8). The company named this exercise a Golf Tournament, where the nine major elements of the measurement system were treated as nine holes of the Golf course. Three types of score were established for each hole to periodically assess the company's performance (see Figure 8.8). On each hole an average industry player would be expected to score over par. A par score ranks a competitor amongst some of the best. A below par score is exceptional, i.e. within the top 25% of players. The aim was to be consistently good on all holes. The tournament is held four times a year. The score for the first quarter of 1996/97 is shown in Figure 8.9. Based on the data obtained from all departments of the company, the Quality College Manager, Financial Director, Training Manager, and Safety Manager measure those nine components for the whole company. Then the results are benchmarked with competitors, (performed jointly by the Quality College Manager and the Steering Committee). Then, the Steering Committee takes appropriate actions to improve performance.

At the early stages of empowerment implementation, diagnostic surveys were carriedout to assess the organisation's readiness to implement empowerment. The results of the survey were reported to the Main Board.

Figure 8.8. Balanced Business Scorecard

Hole	Definition	Score		
		Average	Par	Exceptional
		5	4	3
1.	EMPLOYEE ATTITUDES Positive response rate to quarterly Employee Attitude Questionnaire	60%	75%	80%
2.	TARGET ZERO Latest monthly measurement in weeks	-50	-20 to +20	20+
3.	WASTE EFFICIENCY Savings per operating unit (based on 12 months)	£0.5m	£0.75m	£1m+
4.	WORK WON ON VALUE CRITERIA Percentage of contracts won on 'value', not just lowest tender price	30%	60%	75%
5.	RETURN ON CAPITAL EMPLOYED	10%	15%	20%+
6.	TRAINING & DEVELOPMENT Average number of days each employee spends on training (based on 12 months)	3	4	5
7.	SAFETY Accident frequency rate	1.0	0.7	0.5
8.	CUSTOMER SATISFACTION Percentage of repeat business won from top customers	50%	60%	75%
9.	PROFITABILITY Pre-tax profit margin (based on 12 months)	2%	3%	4%

Figure 8.9. Current score as on 1st Quarter of 1996/97

Hole	Par	Score
1. Employee attitudes	4	4
2. Target Zero	4	5
3. Waste efficiency	4	5
4. Work won on value criteria	4	4
5. Return on capital employed	4	3
6. Training & development	4	4
7. Safety	4	4
8. Customer satisfaction	4	5
9. Profitability	4	3
Total	**36**	**37**

8.3.3.9 Recognition

Accomplishments that improved the business were personally recognised at all levels by their immediate leaders. Recognition activities include: implementation of proposals submitted by employees; publicity; presentation; and Divisional and Group Quality Awards. The Quality award some times were monetary.

Achievements, after the recognition of the immediate line management, were reported to both the regional management (operating units) and Group Steering Committee, which decided the award. Then, the ceremony for the award was organised by respective management. A senior person presented the award to the highest performer.

Some times, presentations were arranged to allow the team/individual to present its accomplishments. The presentation meetings were organised by the head of the appropriate level of the organisation. For example, the Divisional MDs and the Quality College Manager organised these meetings at group level. Teams, senior management and relevant employees attended these presentations. TV, Video, and Slides were used during the presentations. Sub-contractors and suppliers were also recognised for their best performance, predominantly, by using them again on future projects.

8.3.4 A DFD model of empowerment implementation in Company-A

Having described the implementation process of empowerment in Company-A under nine units of analysis, this section describes the DFD model developed from these units. In constructing a DFD, the five-stage process (see Section 8.2) was adopted. It can be seen from the above, that the implementation of empowerment was complex, where, some processes were sequential, some were simultaneous, and some were continuous. When

assessing the major inputs and outputs of the system, three distinct major phases of implementation were identified, they are:

the preparation phase;

the implementation phase; and

the sustaining phase.

Then, detailed inputs, processes, and outputs in each of the phases were identified and respective flows drawn by the use of DFD modelling techniques. After a number of iterations, the final DFD model obtained for all of the three phases of Company-A can be seen in Figures 8.10 to 8.17.

8.3.4.1 Preparation phase

In the preparation phase, the company assessed its organisational capability to adopt the concept of empowerment, and consequently, developed all of the necessary ingredients and resources for the implementation of empowerment (Figure 8.10). The key processes involved in this phase were: development of vision; development of suitable policy; diagnose employee attitudes and organisational capabilities including suitable organisational structure and fund; development of implementation plan; and development of resources. Development of company level vision by senior management (Group Steering Committee) was important. Without this empowered employees would have followed different goals without common objectives. Following the vision, suitable company policy and an implementation plan were developed. Diagnosis of employee attitudes (through questionnaire survey) coupled with the company's policy led to a suitable implementation plan being designed. In all of these tasks, participation by both lower level employees and divisional boards were encouraged. Divisional boards have participated by assisting the Group Steering Committee in the development of vision,

policy, and suitable plan of implementation. Employees have participated by giving their suggestions and comments over these development processes. This has made employees well aware of the company's vision and given them know-how for achieving that vision. Employees were also encouraged to report any resources required for implementing improvement. The Group Steering Committee continuously tracked the implementation process (plan) to identify any resources (e.g. organisational structure, fund) required for the implementation. During the development of company's vision, policy, and plans, external consultants were initially appointed for advise.

The data description of the preparation phase of the implementation model of company-A is as follows.

DEVELOP VISION (*Entry type*: Process)

Specification: This process deals with the following data: new strategic directions and ideas; suggestions; and necessary data and personnel for assistance. The Group Steering Committee was responsible for producing group level vision. This was achieved by participation of employees at all levels of the organisation. For instance, suggestions were requested from employees, consequently, feedback were used for developing feasible vision. Divisional boards have provided required data to, and appropriate personnel (e.g. Directors) for developing vision.

SUGGESTIONS (*Entry type*: Data element/Employees offered suggestions and comments on the vision.)

NECESSARY DATA AND PERSONNEL FOR ASSISTANCE (*Entry type*: Data element)

NEW STRATEGIC DIRECTIONS AND IDEAS (*Entry type*: Data element)

VISION (*Entry type*: Data element)

ADVISE (*Entry type*: Data element)

VISION STATEMENT (Entry type: Transient document)

DEVELOP POLICY (*Entry type*: Process)

Specification: The Group Steering Committee, in conjunction with Divisional boards, developed policy in concordance with the vision. Implications of group level policy of divisional level implementation were discussed with Divisional boards and used in developing company level policy. External consultants were appointed to advise in developing suitable policy.

POLICY (*Entry type*: Data element)

POLICY STATEMENT (*Entry type*: Transient document)

VARIOUS POLICIES AND OPTIONS (*Entry type*: Data element)

DIVISIONAL LEVEL PROBLEMS AND POLICIES (*Entry type:* Data element)

DIAGNOSE (*Entry type*: Process)

Specification: This process deals with the following data: policy; questionnaires; and results. The Group Steering Committee was responsible for diagnosing company's readiness for implementing empowerment. Employee attitudes towards empowerment were diagnosed through questionnaire survey. The questionnaire also included information seeking employees' responses on company's policies. Results of these surveys were distributed to both employees and Divisional boards.

QUESTIONNAIRES (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

DEVELOP IMPLEMENTATION PLAN (*Entry type*: Process)

Specification: This process deals with the following data: policy; results; implementation strategies and plans; and necessary data and personnel for assistance. The Group Steering Committee was responsible for developing a suitable plan for implementing empowerment. The company policies and results of organisational diagnosis were considered and a suitable strategy for implementing empowerment was developed. The Divisional board

played an active role in this process by providing necessary divisional level data and personnel for assistance.

IMPLEMENTATION PLAN (*Entry type*: Transient manual)

IMPLEMENTATION STRATEGIES AND PLANS (*Entry type*: Data element)

DEVELOP RESOURCES (*Entry type*: Process)

Specification: This process deals with the following data: required resources (e.g. organisational structure); resources; required resources; approved minor resources; approved major resources; and approved minor and major resources. Resources required for the implementation of empowerment were assessed at all levels of the organisation. The Group Steering Committee had assessed organisation structure, fund availability, and other resources that had emerged from the implementation plan, and provided them through identified departments. Resources identified by employees, as specific to their business processes, were reported to the Regional Management Team, who in turn, assessed and approved minor resources. Major resources were passed on to the Group Steering Committee, which, in turn, assessed and approved them. The approved resources were finally passed on to the respective department for providing them.

REQUIRED RESOURCES (ORGANISATIONAL STRUCTURE, ETC.) (*Entry type*: Data element/e.g. suitable organisational structure, funds, and employee skills required for implementation).

REQUIRED RESOURCES (*Entry type*: Data element)

RESOURCES (*Entry type*: Data element)

APPROVED MAJOR RESOURCES (*Entity type*: Data element)

APPROVED MINOR RESOURCES (*Entry type*: Data element)

APPROVED MINOR AND MAJOR RESOURCES (*Entry type*: Data element)

8.3.4.2 Implementation phase

The DFD model of the implementation phase can be seen in Figure 8.11 (level-1 DFD) and Figure 8.12 (level-2 DFD). Implementation started with the Group Steering Committee conducting a series of 'information sessions' at various levels of the organisation. The main aim of these sessions have been to: make employees aware of the principles of empowerment including teamwork; and teach problem solving techniques. Initially, external consultants were used to devise an appropriate strategy for training. The earlier training included selected line managers from Regional operating units. After the initial training, operating units were empowered to decide on implementing empowerment within their units. Consequently, interested Regional Management Teams have established Regional Steering Committees and Regional Training Departments. Employees' commitment, attitude and satisfaction towards the empowerment programme were tracked through a quarterly staff attitude survey, which was performed by the Quality College Manager.

In the implementation phase, one of the key tasks was to provide sufficient training on relevant business skills to employees (see Figure 8.12, level-2 DFD). The 'Personnel Development Folders' established for each of the individuals became crucial to monitor improvements in skills. This folder was also used to continuously track training needs for employees. Based on training needs agreed between both supervisors and employees, training was conducted with the assistance of the Regional Training Department. This department assumed full responsibility to identify trainers and arrange training sessions. After training, successful performers, (perceived as having sufficient skills to perform their jobs independently with less supervision) were finally certified.

The data description of the model of the implementation phase of company-A is as follows.

INFORMATION SESSIONS (*Entry type*: Process)

Specification: This process deals with the following data: awareness, problem solving and teamwork principles; and training strategies/advice. A series of information sessions were conducted at various levels of the organisation, where selected employees (line managers from Regional Operating Units) and Regional Management Teams were made aware of empowerment, and taught principles of teamwork and problem solving. Initially, the Group Steering Committee was provided with external consultants to: assist the committee on devising a suitable training strategy for the company; and train it on problem solving and teamwork techniques. The Group Steering Committee then took the responsibility to train employees by conducting 'Information sessions'.

AWARENESS, PROBLEM SOLVING AND TEAMWORK PRINCIPLES (*Entry type*: Data element)

TRAINING STRATEGIES/ADVICE (*Entry type*: Data element)

FORM REGIONAL STEERING COMMITTEES & TRAINING DEPARTMENTS (*Entry type*: Process)

Specification: This process deals with the following data: implementation plan; members, responsibilities and plans; established department; and established committee. After the the information sessions, the Regional Management Teams committed to empowerment have a shared implementation plan with the Group Steering Committee, and accordingly, established Regional Steering Committees and Regional Training Departments. Members of these committees and their responsibilities were established by the Regional Management Team. The line managers who have already been trained through Information Sessions also became members of the Regional Training Department.

IMPLEMENTATION PLAN (*Entry type*: Data element)

MEMBERS, RESPONSIBILITIES AND PLANS (*Entry type*: Data element)

ESTABLISHED COMMITTEE (*Entry type*: Data element)

ESTABLISHED DEPARTMENT (*Entry type*: Data element)

QUARTERLY STAFF ATTITUDE SURVEY (*Entry type*: Process)

Specification: This process deals with the following data: questionnaires; results; and attitudes, satisfaction, problems. The Quality College Manager was responsible for this process. Employees' attitudes, satisfaction and problems have been continuously tracked through the questionnaire survey, and the results distributed to both the Group Steering Committee and Regional Steering Committee, and also to the Regional Training Department. These results were also documented in the annual Survey Report.

QUESTIONNAIRES (*Entry type*: Data element)

ATTITUDES, SATISFACTION, PROBLEMS (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

SURVEY REPORT (*Entry type*: Manual storage)

ESTABLISH PERSONNEL DEVELOPMENT FOLDER (*Entry type*: Process)

Specification: This process deals with the following data: performance; details; and observed performance. Personnel Development Folders were established for each of the individuals by their immediate supervisors. Employees' performance on their business were observed by supervisors and recorded on the Folder. This also included skill deficiencies as observed from performance and subsequent identification of training needs.

PERFORMANCE (*Entry type*: Data element)

OBSERVED PERFORMANCE (*Entry type*: Data element)

DETAILS (*Entry type*: Data element/performance details)

TRAINING SYSTEM (*Entry type*: Process)

Specification: This process deals with the following data: training needs; observed training effects; details; training schedule; progress; members to conduct training; learned knowledge; and skill certificate (see Figure 8.12). Both supervisors and employees have

jointly identified skill deficiencies and needs for training. Identified training needs were then conveyed to Regional Training Departments, which in turn prepared training schedules and sent them to respective individuals. The Training department assumed full responsibility to offer training to employees. Also, if there had to be group training, employees themselves shared their knowledge and experience. After the training, progress in effectively applying learned knowledge to the jobsite were observed by supervisors and reported to the Regional Steering Committee. Successful performers, who were perceived as having acquired sufficient skills to perform their jobs independently with minimum supervision, were finally certified. Progress in skill improvement was reported to the Regional Steering Committee. Details of all these training activities including training needs, progress in performance, and certification were documented in the Personnel Development Folder.

TRAINING NEEDS (*Entry type*: Data element)

TRAINING SCHEDULE (*Entry type*: Data element)

MEMBERS TO CONDUCT TRAINING (*Entry type*: Data/resource element)

LEARNED KNOWLEDGE (*Entry type*: Data element)

OBSERVED TRAINING EFFECTS (*Entry type*: Data element)

SKILL CERTIFICATE (*Entry type*: Data element)

PROGRESS (*Entry type*: Data element)

8.3.4.3 Sustaining phase

At the implementation phase, the company ensured that: employees were sufficiently trained (continuous process); all necessary infrastructures were in place; and an environment of teamworking (between several departments and committees and between supervisors and subordinates) was in place. Following these initial accomplishments, there was a gradual transition into the sustaining phase, where both management and employees

were continuously planning and working for improvements with little or no inspection. This included: both group level and regional level management continuously learning performance expectations/satisfactions and related problems from both customers and suppliers; employees identifying and solving problems in improving their processes; both management and employees measuring performance; and management recognising highest performers (see Figure 8.13, Level-1 DFD and Figures 8.14, 8.15, 8.16, and 8.17, Level-2 DFDs of the Sustaining phase).

PERIODIC SURVEY/MEETINGS (*Entry type*: Process)

Specification: This process deals with the following data: permanent customers; regional level customers/suppliers; expectations/problems; and survey results. Both customers and suppliers were involved through periodic surveys or meetings, where, their requirements and perceptions on the service provided by the company were shared. Results of these surveys or meetings were documented as transient reports, from which company's problems with external participants were identified. Both group level board and the regional management team are involved in these activities and identified problems for improvement. To achieve this, lists of potential customers and suppliers were maintained at both group and regional levels. They were continuously kept informed of recent developments and improvements within the organisation.

PERMANENT CUSTOMERS (*Entry type*: Data element)

REGIONAL LEVEL CUSTOMERS/SUPPLIERS (*Entry type*: Data element)

EXPECTATIONS/PROBLEMS (*Entry type*: Data element)

SURVEY RESULTS (*Entry type*: Data element)

EXTERNAL SURVEY/MEETINGS REPORTS (*Entry type*: Transient document)

PROCESS IMPROVEMENTS BY SENIOR MANAGEMENT (*Entry type*: Process)

Specification: This process deals with the following data: problems; members for Task Teams; group level improvement plans; group level improvement plans for approval;

regional level teams/individuals; problems/plans; detailed plan/implementation. Group level problems were identified by the Group Steering Committee. One of the main sources for identification of problems was External survey/meetings reports. Once significant problems were identified, the Group Steering Committee established Task Teams and provided them with specific problems to solve. The Group level Task Teams, in turn, analysed the problems and provided improvement plans for approval by the Group Steering Committee. Approved improvement plans were passed on to Regional Management Teams, which in turn, according to the nature of the problem and proposed solutions, either established regional level teams or identified individuals for implementing improvement plans. These regional level teams or individuals produced a detailed plan and implemented this in the business. Finally, results of implementation were reported to both the Group Steering Committee and Regional Management Team. This process ensures that expectations of external customers and suppliers were cascaded down to the entire organisation as improvement plans were implemented throughout the organisation. This enabled empowered individuals to focus their business level improvements towards customers' expectations.

PROBLEMS (*Entry type*: Data element)

MEMBERS FOR TASK TEAMS (*Entry type*: Resource element)

GROUP LEVEL IMPROVEMENT PLANS (*Entry type*: Data element)

GROUP LEVEL IMPROVEMENT PLANS FOR APPROVAL (*Entry type*: Data element)

REGIONAL LEVEL TEAMS/INDIVIDUALS (*Entry type*: Resource element)

PROBLEMS/PLANS (*Entry type*: Data element)

DETAILED PLAN/IMPLEMENTATION (*Entry type*: Data element)

RESULTS (*Entry type*: Data element/results of implementation)

GROUP LEVEL PERFORMANCE MEASUREMENTS (*Entry type*: Process)

Specification: This process deals with the following data: attitudes, involvement, satisfaction; data/feedback; survey; training, development, performance; financial statements; analysis/assistance; and results (see Figure 8.15). The Group Steering Committee was responsible for this process. Group level performance was measured four times a year, and finally assessed together annually. The measures included employees' attitudes and satisfaction measured from staff attitude survey; external survey with identified industry competitors (called as Balanced Business Scorecard); and financial performance assessed by the finance departments. Data regarding these measures, was collected from several sources, including, Annual Survey Report, Personnel Development Folders, survey (benchmarking) with competitors, and financial statements from finance departments. They were analysed by the Group Steering Committee, and results distributed throughout the organisation. The finance department assisted the Group Steering Committee in the measurement process.

ATTITUDES, INVOLVEMENT, SATISFACTION (*Entry type*: Data element)

SURVEY (*Entry type*: Data element/Questionnaire)

TRAINING, DEVELOPMENT, PERFORMANCE (*Entry type*: Data element)

FINANCIAL STATEMENTS (*Entry type*: Data element)

ANALYSIS/ASSISTANCE (*Entry type*: Resource element)

DATA/FEEDBACK (*Entry type*: Data element)

RESULTS (*Entry type*: Data element/Group level measurement report)

PROCESS IMPROVEMENTS BY EMPLOYEES (*Entry type*: Process)

Specification: This process deals with the following data: problems; assistance; plan; analysis/initial statement; initial statement for approval; approved initial statement/assistance; fund; plan and cost benefit analysis; implementation plan; success criteria/results; results; performance; and completion report (see Figure 8.16). Employees or Teams identified problems for improvement through several sources, including problems that emerged from their own day-to-day business activities and external

problems that were reported through External survey/meetings reports. Then, with the assistance of supervisors or team members or leaders, appropriate solutions (plans for improvement) were established. Cost implications of the proposed plans were assessed with the assistance of regional level finance departments. 'Initial Statements', comprised of improvement plans with measurable objectives, in terms of customer satisfaction and cost-benefits, were submitted to the Regional Management Team for approval. After implementation of approved proposals, consequent benefits (cost) achieved were analysed and reported to the Regional Management Team. In all stages of this process both employees/teams and supervisors/leaders worked closely and shared their knowledge in effectively identifying and solving problems.

PROBLEMS (*Entry type*: Data element)

ASSISTANCE (*Entry type*: Resource element)

PLAN (*Entry type*: Data element)

ANALYSIS/INITIAL STATEMENT (*Entry type*: Data element)

INITIAL STATEMENT FOR APPROVAL (*Entry type*: Data element)

APPROVED INITIAL STATEMENT/ASSISTANCE (*Entry type*: Data element)

PLAN AND COST BENEFIT ANALYSIS (*Entry type*: Data element)

SUCCESS CRITERIA/RESULTS (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

PERFORMANCE (*Entry type*: Data element)

COMPLETION REPORT (*Entry type*: Manual storage)

INITIAL STATEMENT (*Entry type*: Manual storage)

COMPLETION REPORT (*Entry type*: Manual storage)

RECOGNISE ACHIEVEMENTS (*Entry type*: Process)

Specification: This process deals with the following data: performance achievements; award details; selected accomplishers; and awards/thanks. Highest performance accomplishments were identified by supervisors or team leaders, and reported to either the

Group Steering Committee or the Regional Management Team. After unbiased assessments made on those accomplishments, selected performers received awards (e.g. gifts, cash) by senior management in formal meetings specially conducted for this purpose.

PERFORMANCE ACHIEVEMENTS (*Entry type*: Data element)

SELECTED ACCOMPLISHERS (*Entry type*: Data element)

AWARD DETAILS (*Entry type*: Data element)

AWARDS/THANKS (*Entry type*: Resource element)

Figure 8.10. Level 1 DFD - Preparation phase (Company A)

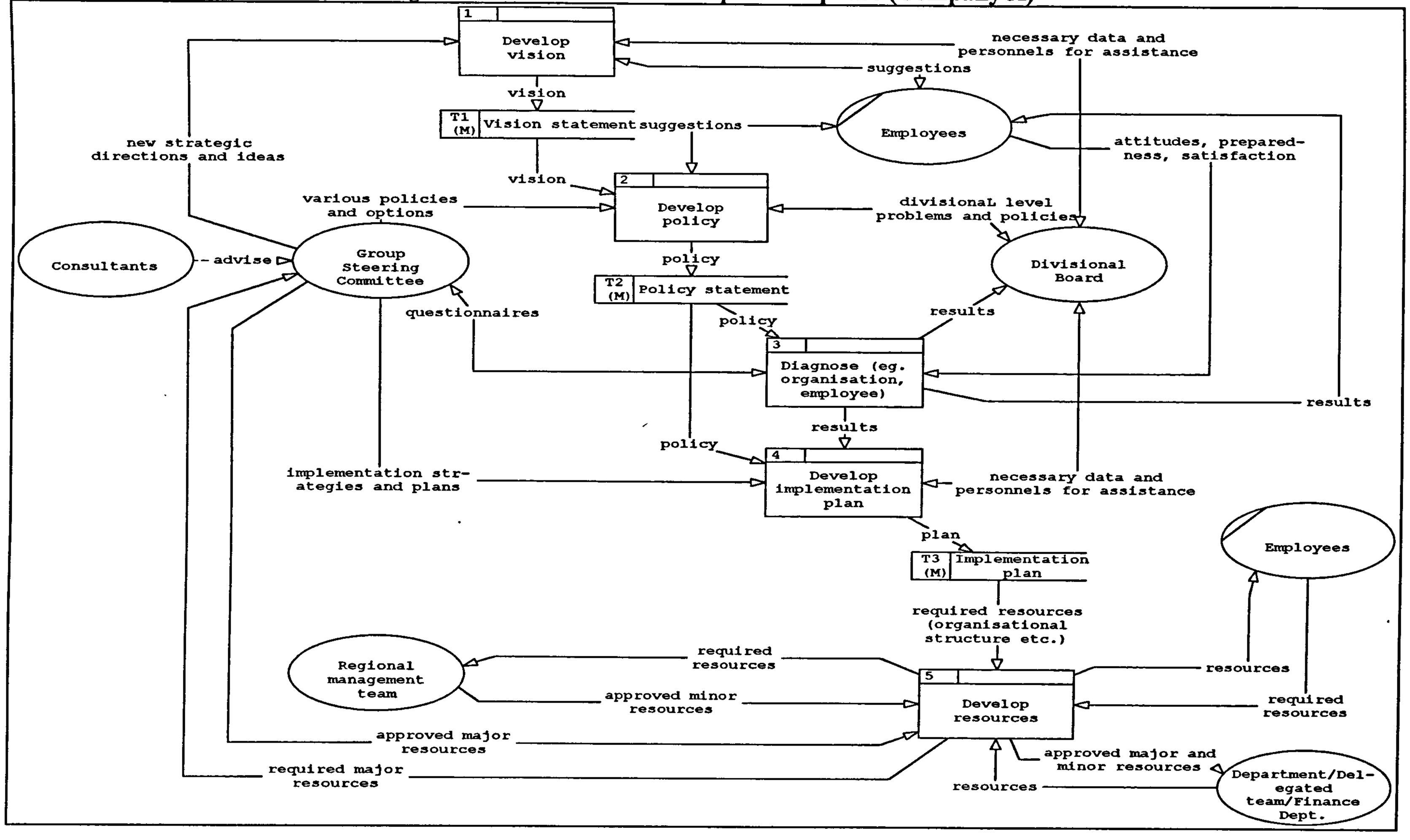


Figure 8.11. Level 1 DFD - Implementation phase (Company A)

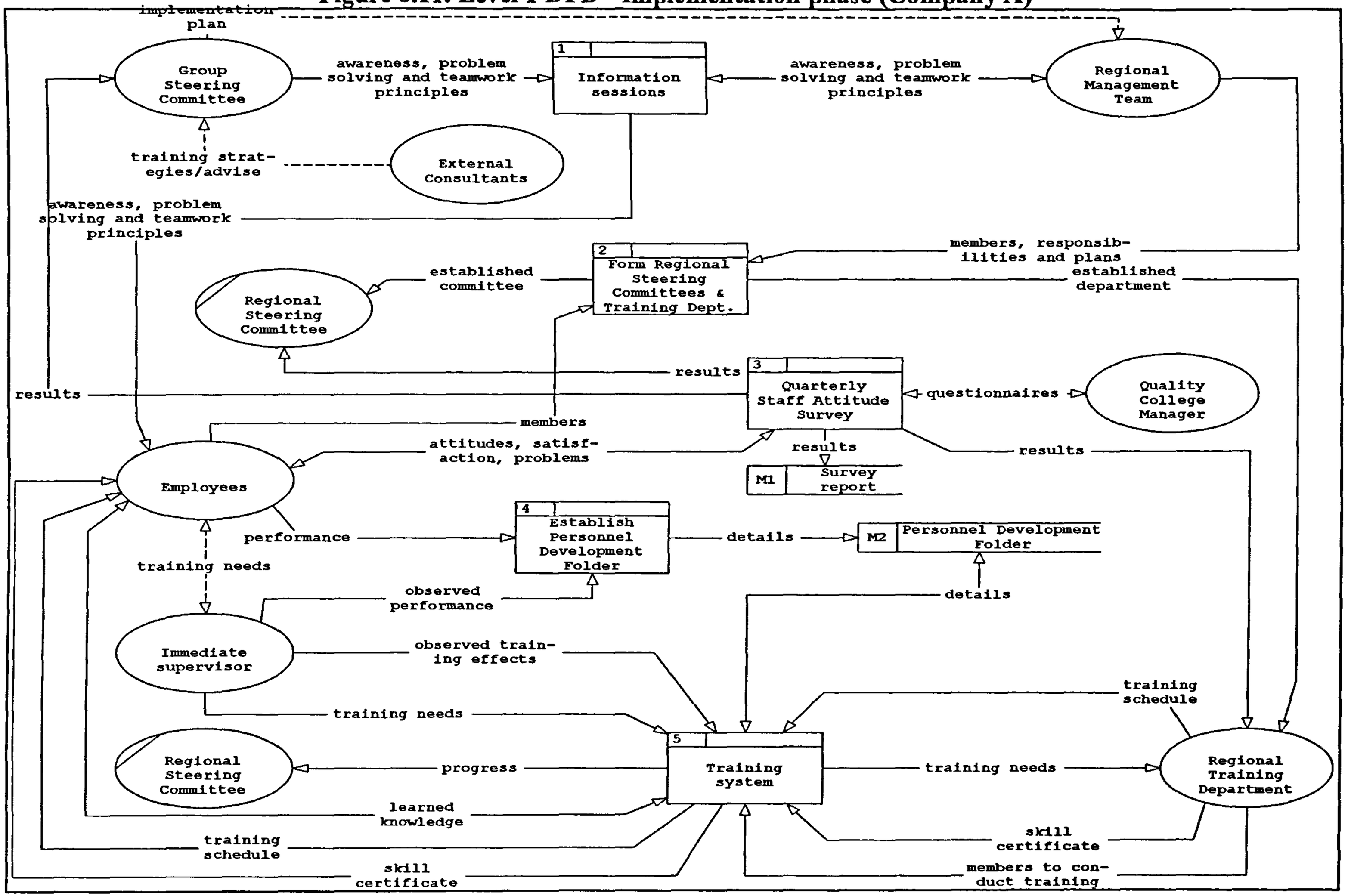


Figure 8.12. Level 2 DFD - Training system (Company A)

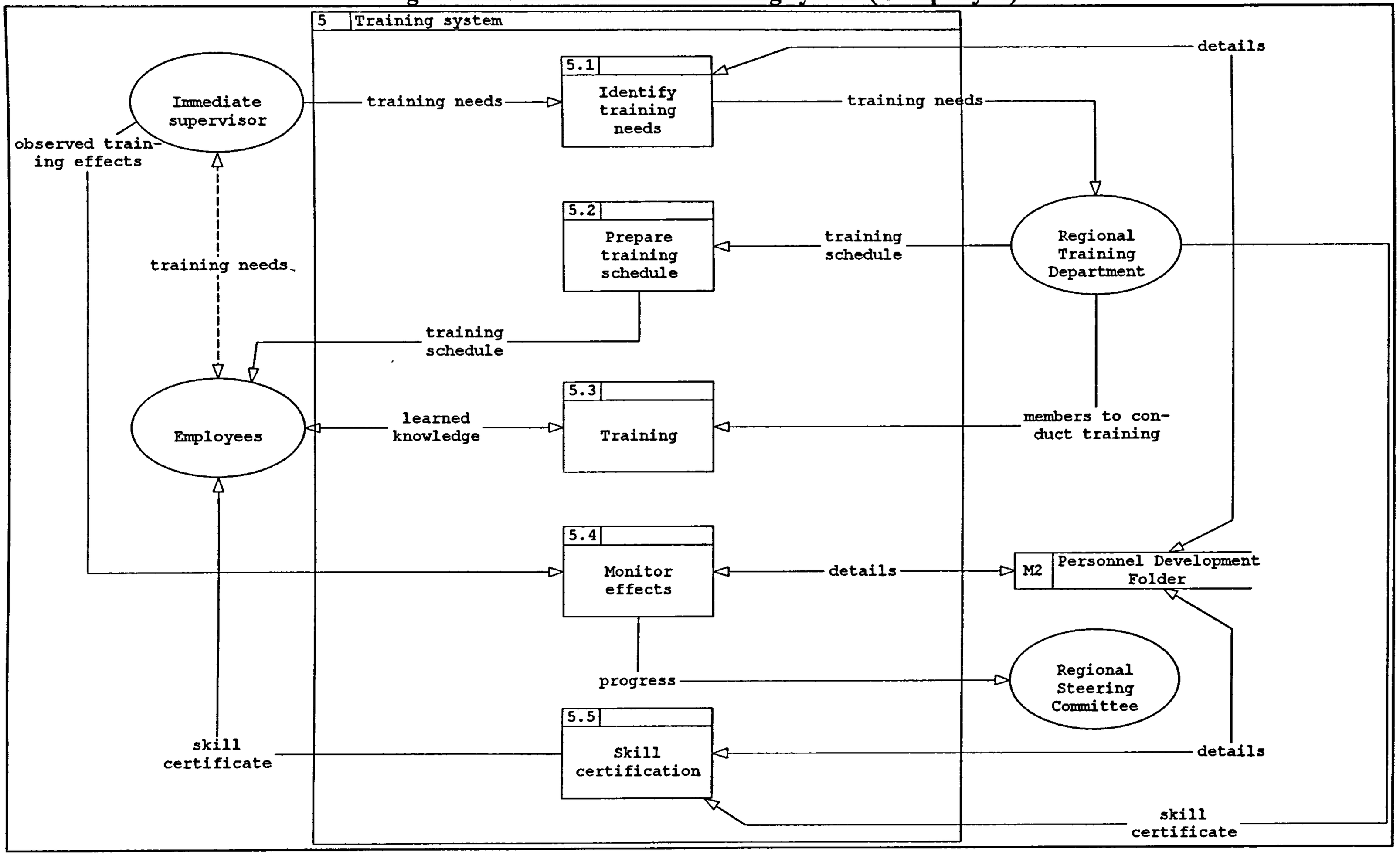


Figure 8.13. Level 1 DFD - Sustaining phase (Company A)

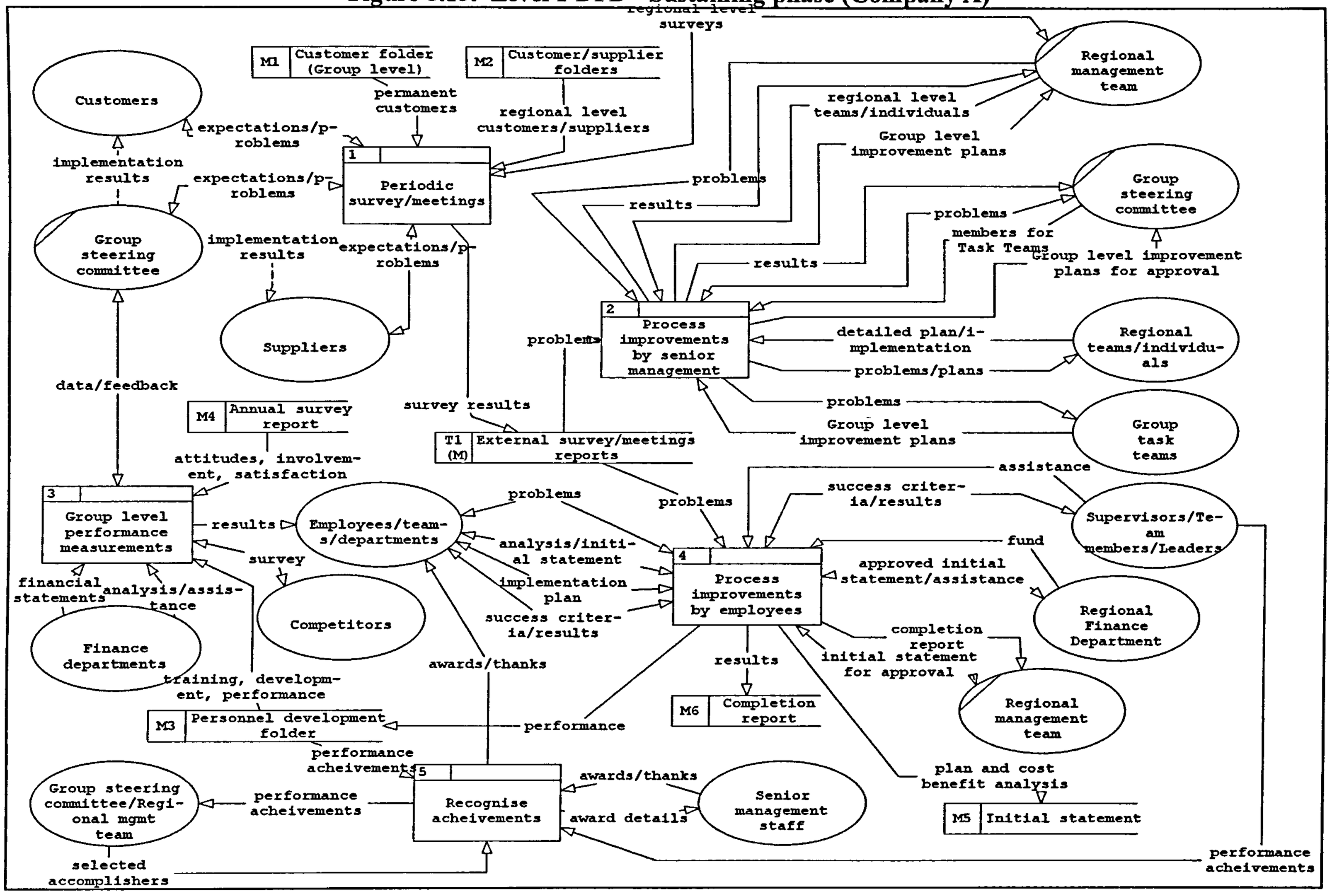


Figure 8.14. Level 2 DFD - Sustaining phase - Process improvements by senior management (Company A)

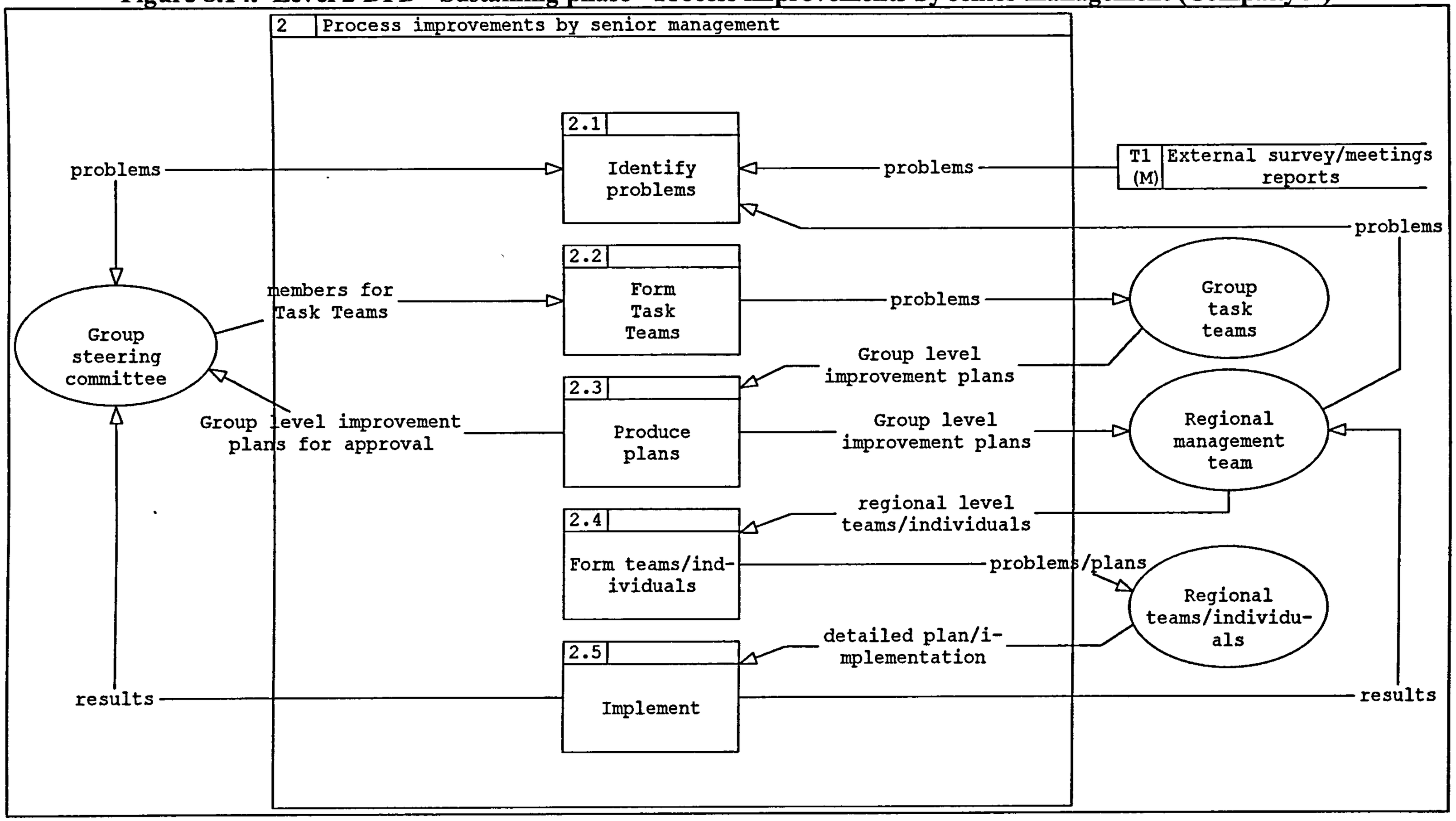


Figure 8.15. Level 2 DFD - Sustaining phase - Group level performance measurement (Company A)

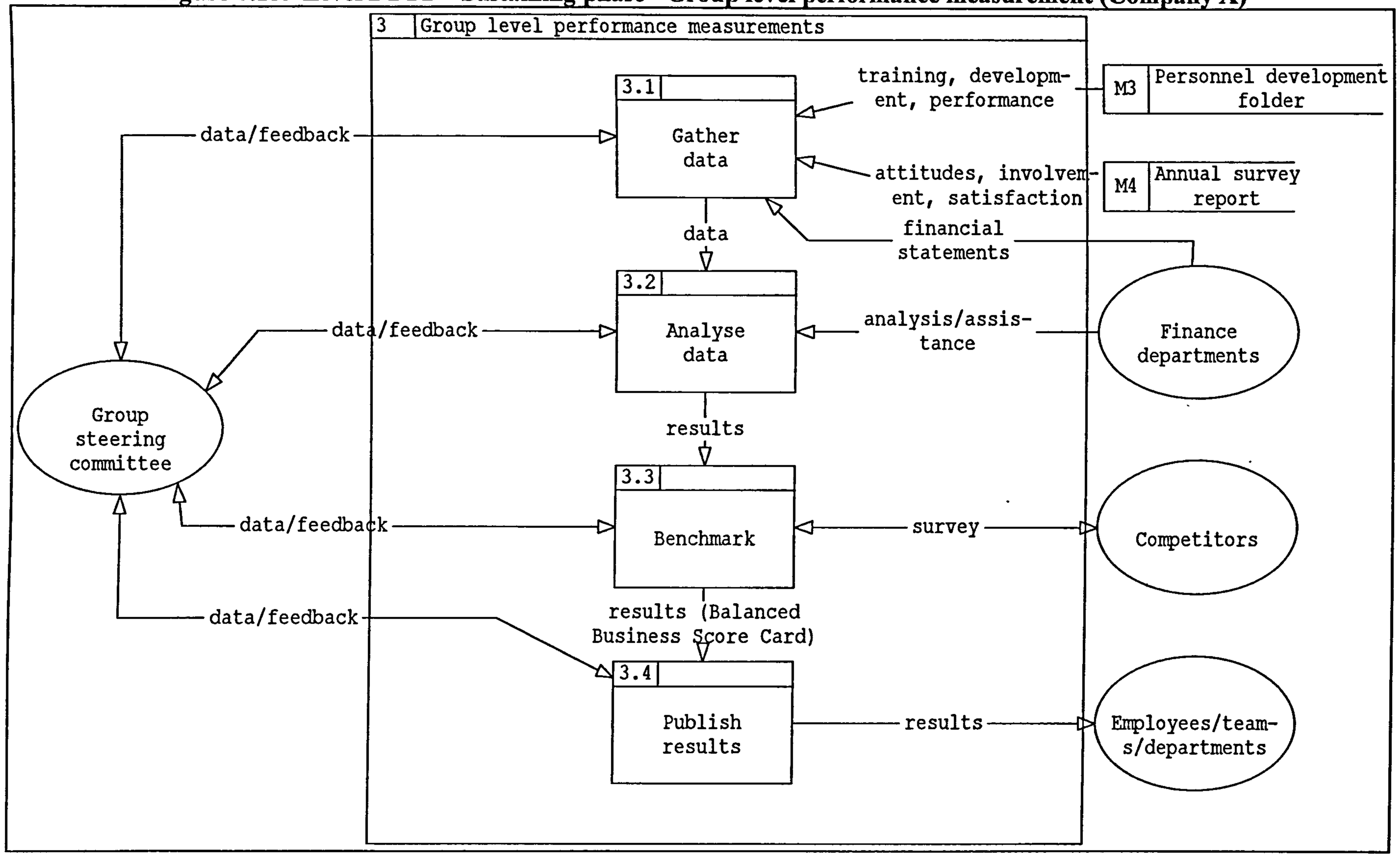


Figure 8.16. Level 2 DFD - Sustaining phase - Process improvement by employees (Company A)

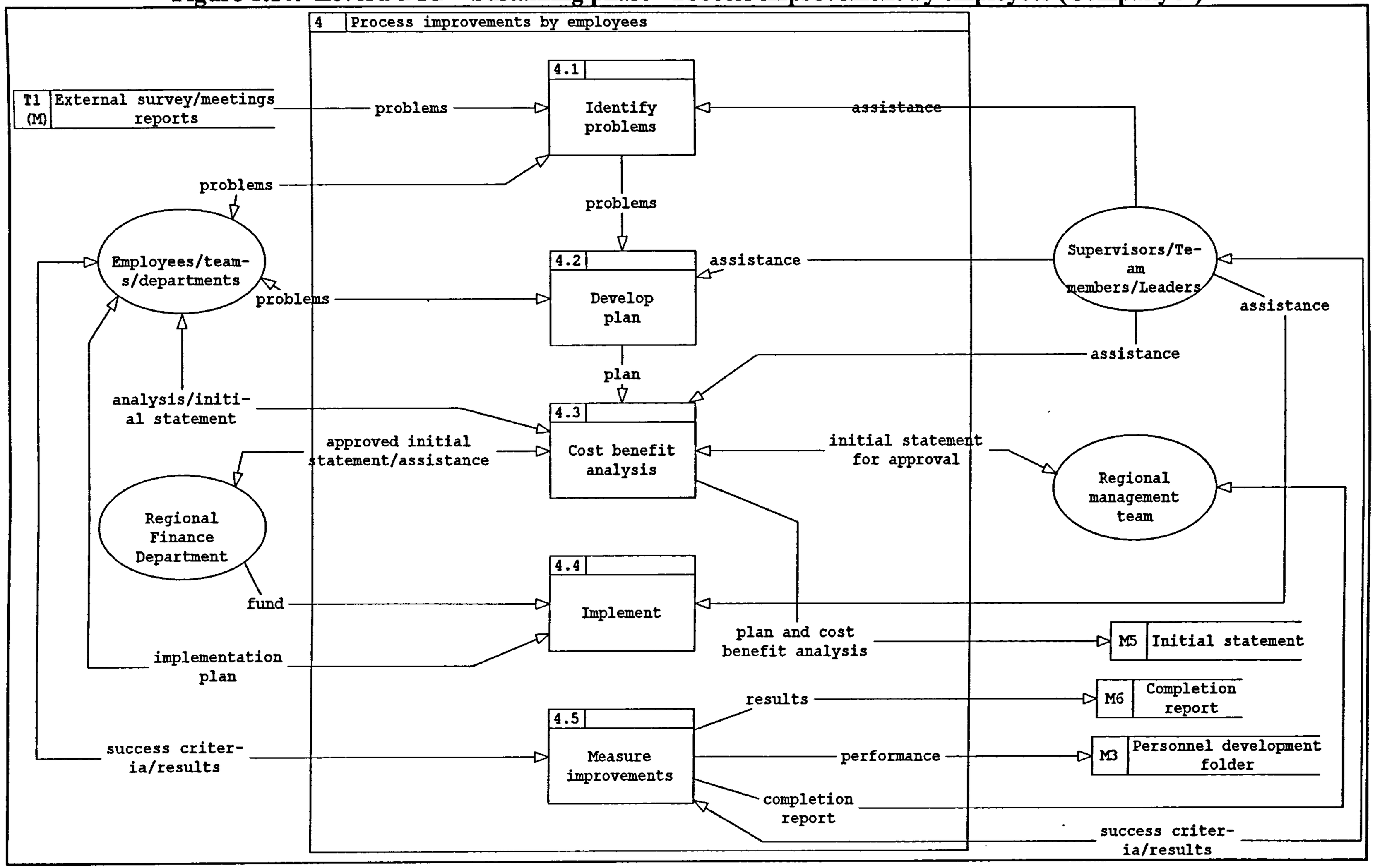
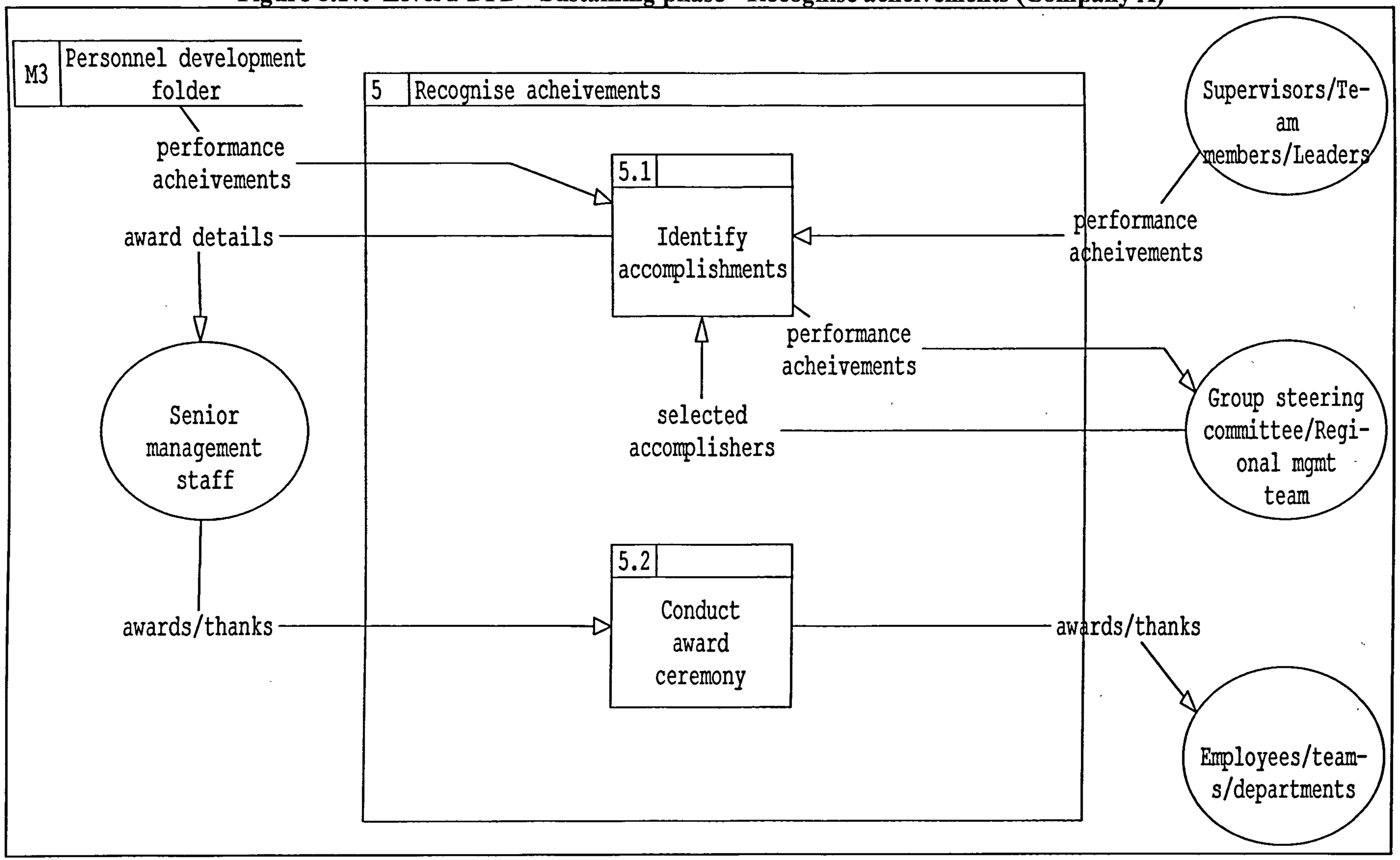


Figure 8.17. Level 2 DFD - Sustaining phase - Recognise acheivements (Company A)



8.4 Case study 2: Empowerment implementation in Company-B

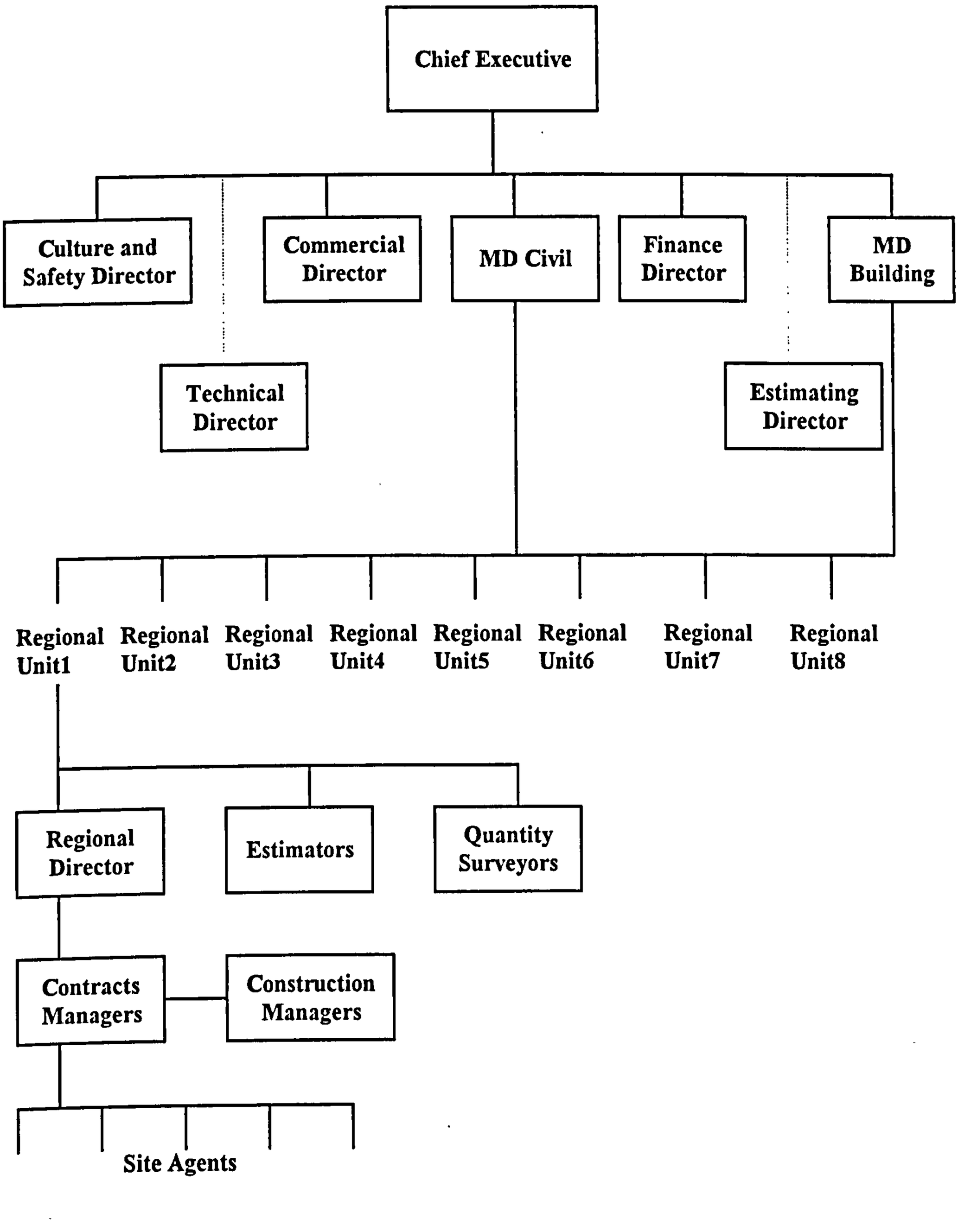
Company-B is a major construction organisation operating throughout the UK, including London, South Humberside, Birmingham, Bristol, Cheadle, Glasgow, Liverpool, Middlesborough, Normanton, Northampton, and Tunbridge Wells. The group comprises three major sub-groups: Properties Ltd; Construction Ltd; and Equipment Ltd. The Construction Group has two major divisions: building and civil engineering. The Civil Engineering division includes process engineering (see Figure 8.18). Total number of employees is approximately 1200. The company's annual turnover for the past three years centres around £300M, and suddenly grew to £370M during 1996. Following are the figures since 1993.

Year	1993	1994	1995	1996
Turnover in millions (£)	325	330	280	370

8.4.1 Organisation and company policies

Management structure of the company can be grouped under three major levels of hierarchy: the Main Board; Regional Management Teams; and site (Direct work) (see Figure 8.18). The Main Board includes Chief Executive/Chairman, Finance Director, Commercial Director, Culture and Safety Director, Managing Directors for building and civil engineering divisions, Technical Director, and Estimating Director. The Main Board meets regularly to discuss on group performance and strategic objectives.

Figure 8.18. The organisational structure of Company-B



There are eight major regional units, each of which comprises Regional Directors and management board including Estimators and Quantity Surveyors. Each regional unit

operates with maximum freedom and scope for decision making and reports periodically to the divisional MD. The Direct Work level includes Contracts Manager, Construction Manager, site agents, and other staff and office bearers, who are involved in the day-to-day operations at construction site. At the time of conducting the case study, the company had a policy of non-direct employment for site level operatives.

Company policies

The main policy of the company is employee development through empowerment. Every individual is provided necessary resources and support to improve their performance by continuous learning. Consequently, the intention is to engender a learning organisation that continuously strives for performance improvement. Through this principle, the company is committed to quality, productivity, and safety in its business activities.

8.4.2 Background to empowerment and quality in Company-B

Since the late eighties, company B has undertaken several steps to improve quality and productivity in its business. Predominantly, two major initiatives were instigated in the early nineties, these being QA (Quality Assurance) and TQM (Total Quality Management). During 1991, the company established its quality policy, i.e. ensuring compliance with approved specifications, systems, and procedures. Subsequently, in the same year it registered for ISO 9001, and a separate Quality Assurance department was established to oversee and monitor quality functions. In 1993, the quality policy was revised, and quality was defined as part of everyone's business, and not just as one inspected by line management. Consequently, TQM was implemented with the objectives of: creating environment for employees to involve in the business; create good relationships between management and employees; reducing waste; improving skill levels of employees; and increasing negotiated work with customers. Employees commitment

and involvement in improving their own performance was considered essential to achieve these objectives. Thus, the policy of empowerment was introduced as a part of TQM.

8.4.3 Empowerment implementation in Company-B

8.4.3.1 Leadership

Leadership existed at all levels of the organisation; from strategic to direct work levels. A participative style of leadership was adopted, and perceived as key for successful implementation of empowerment. This included 'openness' and 'honesty' with subordinates.

The Main Board, comprising 33 senior management staff (including the Chief Executive, Regional Directors, Cultural Director, and other commercial Directors) was the key body that accelerated the implementation process. This board was called the 'Dream Team', and was adopted mainly to avoid any feeling of superiority over employees. The Chief Executive became the leader of the Dream Team and encouraged team members be cheer leaders and role models for followers to evaluate. Initially, this team produced a group wide vision statement as below.

The vision statement was then distributed throughout the entire organisation addressed to each individual, following which, individuals were given informal clarification about the vision on request. Later, a workshop was conducted to enforce the vision, where, employees were asked for their comments and suggestions on the vision.

THE VISION

COMPANY-B BUILDS DREAMS

1. Company-B is open minded.
Relatedness throughout the company generates trust, support and commitment, backed by honest and powerful communication.

Innovation is fostered without boundary.

2. Company-B is totally committed to lasting profitable relationships based on trust, integrity, quality and performance.

3. People are valued, developed to be empowered, inspired, self motivated and fulfilled which is a source of pride for all.

The next phase for top level management was to show its commitment to the vision by providing continuous support and resources to employees to enable them to achieve it. These included being examples for others to follow, and senior staff's walkthroughs. For instance, the Chief Executive walked through all departments and discussed with employees their problems and improvements. Similarly, all managers and superiors acted as leaders and assisted their subordinates in improving their performance.

Leaders at middle and lower levels were identified for each individual project. Once the project was completed the leaders and related teams were dissolved and rearranged for the next project. Such leaders were elected by consensus of team (or section) members and also relevant members of both immediate higher and lower levels of that team. The term of leadership was very flexible. Depending on the project circumstances and work load, leadership was rotated amongst members. Besides these formal leaderships everyone was encouraged to become leaders themselves in planning their processes and other business related activities for improvement. This was put into effect by a special scheme called a

'Self Development Vision', which was designed as a tool to help employees map their plans and ambitions. This system was mainly introduced to enable employees set their vision themselves (what they want to be and what they want to do) and accordingly work to achieve it. According to this system, an individual can find a partner (may be his/her manager, colleague, or friend) who should be someone who the individual can trust and respect, and who can listen, and helps the individual to discover right solutions. The main reason for introduction of this system has been: that the rapid change of the world of work; with people having to change roles, develop new careers, and swop outdated skills for new ones, that it is increasingly difficult for one person to prescribe for others what they should learn next. Another reason for the empowerment of learners was reported that people who were determined to develop themselves have much more motivation to learn and succeed than those who are instructed to learn something for the good of the company. Self-motivated self-starters can be relied upon to respond with initiative in a wide variety of circumstances. The company could not operate as a learning company if employees had to wait to be taught, and who must have permission before they could act.

All employees were offered training on leadership skills including listening and being approachable. Team dynamics included interpersonal skills, team building, and co-ordination.

8.4.3.2 Empowerment system

The Dream Team was responsible for steering the implementation of empowerment, and assumed full responsibility for overseeing the implementation procedure and efforts. They established the empowerment policy as part of the quality policy, in concordance with the company's vision. The Dream Team, then organised a workshop and encouraged everyone to participate in it. Several issues and required changes related to empowerment

were discussed and constructive comments and suggestions were considered for incorporation into the implementation strategy. The majority of employees welcomed the empowerment policy, however, some scepticism was existent. A few employees who were reluctant to adopt empowerment had left the company, and those who were reluctant but still remained, were encouraged further to participate in the system. Those who were enthusiastic were given key positions in the implementation process. Currently, 100 per cent of employees are aware of and adopt the empowerment concept.

After the workshop, the Dream Team prepared the implementation procedure for every division to implement itself. Each division was empowered to decide its own strategy in this respect. However, the implementation progressed from higher levels of the organisation; first at the board level, then the middle level, and finally at the lower levels. Once it was successfully implemented at higher levels, next the immediate lower levels were considered for implementation. The Dream Team periodically met (once a month) and discussed issues and problems related to the implementation; they continuously tracked the implementation efforts and monitored their effects.

After the full implementation, relationships between super ordinates and sub-ordinates were changed into: parent-child relationships; teamwork; and free and open exchange of ideas. Roles of employees were reorganised into one of teamworking and being cross-functional.

8.4.3.3 Resources development

The fundamental resources that the company considered to be important for empowerment implementation were: organisational restructuring and funding. The key participants involved in the development of resources were members of the Dream Team.

A formal committee (known as the Resources Development Committee and comprising members from the Dream Team) was set up to look after the resources that were available for the change. This committee analysed organisational and monetary requirements needed for the implementation of empowerment and monitored whether they were available at the point of need. The committee was a temporary one and existed for only six months during the early period of implementation. Subsequently, responsibility of this committee was taken over by the Dream Team which continuously monitored required resources for the empowered workforce.

Reengineering the organisation or business processes was a continuous operation, performed as and when required. The Resource Development Committee, initially, took responsibility in this respect. Main reasons reported for the organisational restructuring have been to: quickly respond to change; involve customers and suppliers; and flatten the organisation to improve communication. (These problems were inherent in the old structure of the company). The organisation was redesigned based on two important criteria: self-managed teams/individuals and cross-functional teams. These were analysed carefully from the implementation plan to determine as to what resources and organisational changes would be required. The whole organisation was transferred into several teams at their own functional levels. During the planning of reorganisation all the relevant low level employees were invited to offer suggestions and comments. Based on the facts and comments the final functional structure of the company was developed and again put forwarded to employees for comments through monthly meetings and publications. Finally, after acceptance by all employees, it was implemented. Restructuring was initially planned for the whole organisation, however, the implementation was performed only one level at a time, progressing top downwards. Over six months period, the whole organisation was functioning in accordance with the new structure.

The main resources that were developed to improve working conditions included: health and safety at site; new office provisions and layout; and computer oriented information technology. Health and safety activity instructions were provided at sites through posters and advisors. In some parts of the group, new offices were constructed and layouts of the existing offices were rearranged so as to make employees feel better with the working environment and improve communications. These resources were managed by the Regional Management Team. Needs for these resources were received by the Regional Management Team from all departments and individuals, and then sanctioned. A computer oriented information network system was developed to enhance communications amongst different sections and departments. This system was mainly developed by the in-house specialists and with little assistance from external consultants.

Costs of the above resources were met by a central fund. Usually, the accounts departments at group level and divisional level were responsible for estimating the cost of resources and submitted these to the Dream Team and Regional Management Team, respectively for approval. Similarly, each department and team were empowered to use funds (small budget) for their improvement activities without the permission of the Regional Management Team. The limits of these funds varied depending upon the nature of the tasks. If it was a major estimate, Regional Management's permission had to be sought. For instance, the Benchmarking Team used department's fund for benchmarking activities such as visits, survey, etc., without permission from their superior. However, there were no solutions in place to evaluate the cost implications of employees' decisions on their business related activities; employees were allowed to implement their ideas and learn the cost implications by mistake. However, great care, continuous planning, and inputs from several experts have avoided the occurrence of such mistakes.

8.4.3.4 Involvement

The company used a strategy of "voluntary participation" to involve all employees and relevant external participants (customers and suppliers) in the empowerment system. The Culture Department, headed by the Culture Director, was responsible for continuously monitoring the involvement activities. This department was also a part of the Dream Team. Empowerment awareness through several workshops, publications, and publicity of successful accomplishments of both departments and individuals facilitated a quick change among employees to become involved in. The involvement programme lasted for one year for the whole organisation to be involved in.

Initially, workshops were conducted as induction programmes, and employees were taught: the principles of empowerment; teamwork, responsibilities to own their processes; and problem solving. The Dream Team organised these workshops. The Culture Director and Culture Manager were responsible to follow up the involvement rate and related problems with the assistance of the Training department. Any problems experienced in the involvement programme were referred back for the Culture department to solve. To continuously involve employees in the empowerment process, any grievances realised by them were reported to immediate superiors, and depending on the seriousness of the problem, either the respective superior or the senior management solved them immediately. Employees' satisfaction on their jobs was assessed by collecting data through several forms: questionnaire survey; personal contacts; and workshops. The Regional Management Team was Responsible for this task, reporting results back to employees and to the Dream Team as well.

Contact was continuously maintained with customers who were periodically updated on the developments in the business. This included the company's commitment to TQM and

empowerment and, consequential benefits. Customers showed greater curiosity when they were informed of the implementation process. In order to understand their expectations and satisfactions, customers were contacted through several forms: questionnaire survey; visits to customers' premises; telephone contacts; and attending seminars conducted by customers. Similarly, a list of favourable suppliers and sub-contractors was maintained, and were involved in the business through personal discussions, conferences, meetings, and questionnaire survey. Empowerment policy and the implementation strategies were informed to them after the successful implementation. It was not insisted that suppliers implement empowerment within their organisations. However, in future, the company planned to request them to do so. Since almost all of the company projects were controlled by sub-contractors and suppliers, they were considered as extended business units of the company. Thus, the company realised that sub-contractors' employee empowerment was important to maximise the potential benefits of empowerment. Based on this understanding, the company also assisted them to develop their business upon request. All of the above dealings with both customers and suppliers were dealt with mainly by the Regional Management Board and partially by the Dream Team. Once a month, suppliers and sub-contractors were informed of the company's expectations. These were achieved either by meetings or questionnaires. Some times, their organisational management capabilities were assessed through questionnaires and/or audits. Contracts managers, construction managers, and other operational level staff performed these assessments and reported to the Regional Management Team.

8.4.3.5 Education and Training

The major training strategy of the company was activity based, being mainly achieved by individuals themselves through the 'self development vision' scheme. The key themes in this scheme were based on the following words of great people:

Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning stays young. The greatest thing in life is to keep your mind young.

Henry Ford

I would rather entertain people in the hope that they will learn than teach people in the hope that they will be entertained.

Walt Disney

Everyone is surrounded by opportunities. But they only exist once they have been seen. And they will only be seen if they are looked for.

Edward de Bono

Personally I'm always ready to learn, although I do not always like being taught.

Winston Churchill

The key principle of the above themes is that individuals should diagnose their learning needs by searching around the learning opportunities and finding the way to learn themselves. The Self Development Vision starts with individuals committing to: learn a job; master a current difficulty; and advance their career. First, dissatisfaction or discomfort related to their current state should be identified, and diagnosed by themselves (i.e. why they are currently dissatisfied and how to move forward from that state). This process is called self-diagnosis. In this process, everyone needs to have a partner who may be either the manager, supervisor, or colleagues, and friends to listen and help to discover the right solutions. By using the self development vision statement form (see Figure 8.19), individuals can continuously identify their training needs and learn themselves with the assistance of the training department. As part of the self-training

(development) process, individuals were encouraged to periodically conduct a 360 degree appraisal survey (see Appendix D) to identify development areas and continuously learn.

The self-managed training process, discussed above, was the mature stage of the company's training system. Initially, employees at all levels, including strategic, operational, and direct work, received training on general issues such as leadership, communication, presentation skills, problem solving, and so on. A seperate training department, comprising representatives from each department and culture and learning department, performed this training. The main role of this team was to develop training strategies and plans and provide all resources and expertise to implement them.

Initially, external consultants were used for advice in the design of the training strategy. Based on the needs and deficiencies, training topics were diagnosed by the training department for various levels of the organisation. Depending on the nature of the training, both group-training and individual-training were performed. General training was conducted at some formal place (for example, workshops were conducted to train employees awareness on empowerment), and job-specific training was given at the respective work place.

Figure 8.19. Self Development Vision

Name..... Vision Partner.....

1. What would make my life/time at work more enjoyable?
- What can I do about it?

2. What is my personal vision? (Try picturing yourself in say five years time - if you looked back what would you have liked to achieve?) Ask yourself:
- where do I want to be?
- What do I want to be?
- Do I need help? If so, from whom?
- What are the alternatives?
- What do I enjoy?
- What are my greatest natural talents?

3. To achieve my vision what personal development will I require?
For example:
- Career advancement
- Master a current difficulty
- Understand a new area
- Help develop someone else
- Free-time interest

4. What do I need to learn to be able to develop?
- Is it behaviour I will try to change?
- What knowledge or skill do I intend to gain?

5. By what method am I going to learn?
- By talking to and learning from someone who I respect and trust
- by experiencing new or different situations and tasks
- Secondments and visits to other sites, offices, departments, companies or industries
- Further education
- Professional development
- Computer based training
- Special projects
- Relevant books, reports, articles in journals
- Reflecting and analysing events
- Coaching or tutoring by a colleague
- Training courses

6. Method of assessment.
- What evidence will I show to demonstrate what I have learned?
- How can I measure successful learning and development?

7. Review and completion dates.
- When I review progress with my partner?
- When do I hope to have reached my objective?

8. Agreement.
Your signature.....Partners signature.....
Date.....

The job-specific training at site level was conducted by both Construction Managers and Site Representatives in collaboration with the Training department. Cross-functional teams established throughout the organisation enabled training employees on multi-skills amongst the members themselves. After initial training, employees were encouraged to adopt the Self Development System to continuously train themselves.

Sub-contractors and suppliers were also offered training on many areas, including quality, empowerment, technical, and safety. The project-specific team of the company usually offered such training to them.

8.4.3.6 Teamwork

Teamwork was adopted at all levels of the organisation. At top level, the company's vision, policies, and procedures were established jointly by the members of the Dream Team. Although the team was led by the Chief Executive, everyone in the team was treated equally. This team met once a month and discussed all relevant issues to improving the business.

At middle level, several kinds of teams were formed, including, Benchmarking Teams, Quality Improvement Teams (QIT), and Regional Management Team (functional line department). The Benchmarking Teams and QIT's and other delegated teams were organised by the Regional Management Team. The size of these teams varied from between three and ten members. Leaders for these teams were elected internally. Team members jointly set both short and long term goals. Team meetings and problem solving processes were facilitated by the leaders of the teams. The goals and subsequent achievements were reported to the Regional Management Team.

Self-directed teams were established at site level, which were mostly temporary teams for the life of each project. These comprised key site agents, supervisors and staff and supervisors of sub-contractors and suppliers. Once the project was awarded, and the participants (sub-contractors, suppliers) were selected, the site agents and supervisors identify themselves their counterparts and organise their teams. These teams were formed around a specific aspect of the job. Leaders were elected by themselves, however, it was very flexible. Sometimes the leadership was rotating amongst members. These teams met frequently (everyday) and discussed the plan for the day's work and also for next weeks or months. The meetings were very informal, and goals and development plans were decided by consensus. The main duty of this team was to identify and solve problems at site. Results of performance were reported to the immediate higher levels of the organisation. The project managers, and other high level authorities at site level participated in these teams and assisted them in solving problems for improvement.

8.4.3.7 Process improvement

Depending up on the nature of a process, process ownership for both teams and individuals were adopted. Processes that covered specific functions (i.e. functions that were not multidisciplinary) were identified, and depending upon the need, either an individual or team was identified to own each one. Also, process owners were allowed to contribute to the improvement of others' processes through the suggestion scheme and cross-functional teamwork. The suggestion scheme was a very informal one; encouraging individuals to informally suggest to others how to improve their processes. The Self Development Vision was one of the tools via which suggestions for improvements were made (see section 8.3.4.5). The partners, in the process of self development vision, played a greater role in offering suggestions and assistance for process improvements in others'

jobs. The self development vision scheme was used to improve both the process and business related skills of employees.

No restrictions were set by the management on individuals taking decisions for improvements in their processes. Within their own process level, they were allowed to take any decisions for improvements provided that those decisions did not affect others. However, the management encouraged individuals to consider 'customer satisfaction' (both internal and external) as the main criterion. Individuals at site level can directly contact the Regional Management Team for advice and approval on major decisions for changes.

Most of the problems at site level were jointly solved by individuals/work teams and regional level management. In turn, problems in the higher levels of the organisation (depending on the need) were also solved by obtaining inputs from lower level employees through surveys.

Performance improvement plans were produced by all departments by head of department, in conjunction with department members. These plans normally addressed both the short and long term goals. These plans were updated periodically depending on changes perceived in customers' expectations and related problems. These plans were distributed to all individuals in a department. Similarly, improvement plans at site level were prepared by teams, and the site manager was responsible for producing this plan. Both the department level plans and site level plans were implemented by identifying and delegating appropriate personnel. The head of the department and the site manager monitored progress of these plans at their levels appropriately.

8.4.3.8 Measurement

It has been stated in section 8.4.3.4 that Regional Management Teams and the Culture department measured critical factors such as customer satisfaction, employee satisfaction, annual turnover, and new customer base, and compared these against goals. These are measured through mainly, questionnaire surveys. Results of measurements were published through newsletters. Besides these measurements, company's overall performance was benchmarked with identified competitors periodically by the group level Benchmarking Team composed of members from the Dream Team. Measures considered for benchmarking included: quality, safety, customer satisfaction, and employee turnover. Company level performance of these measures were calculated from performance results obtained from all Regional Management Teams. Usually, the benchmarking studies were undertaken through questionnaire survey. Results obtained from the benchmarking studies were compared against the goal of the company, and accordingly further developments were undertaken.

At site level, measures such as time, waste, rework, and training effects were measured by employees themselves and reported to both partners and the Regional Management Team. Performance were mainly measured through questionnaire survey called a '360 degree Feedback for Colleagues' (see a sample of the questionnaire in Appendix D). The main contents of this survey included the following assessment of individuals:

- Communication skills
- Contribution for others' success
- Helps other to learn
- Decision making
- Process ownership skills
- Leadership skills.

Every individual would send the questionnaire to relevant individuals around 360 degrees both within the organisation and external organisations including, customers, suppliers, and sub-contractors. Responses received from individuals are analysed by simple statistics (frequency, tabulation and so on) and the results reported to the Regional Management Team, which in turn submits them to the Dream Team. Thus, there was no inspection from top management; employees measured their performance themselves and reported to line management.

8.4.3.9 Recognition

Personal thanks was the most important recognition activity adopted by all leaders to their sub-ordinates. Besides this, a formal reward system was maintained throughout the organisation. Depending upon the choice of the individual being rewarded, either cash or a gift was presented. Some times they were paid for their higher education. An individual who accomplished something reported to the immediate superior or partner, who inturn passed the achievement to the Regional Management Team which finally decided the reward. Then, the accomplishers were rewarded by senior management staff at a meeting arranged by the Regional Management Team. All kinds of achievements were recognised, including cost reduction, zero defects, overall improved performance and so on. The performance of suppliers and sub-contractors were recognised by the site management team, mainly by thanks and appreciation, and also recommending them for use on future projects.

8.4.4 A DFD model of empowerment implementation in Company-B

Similar to company-A, investigation of the above nine units of analysis of company-B led to group the empowerment implementation process into three major phases: the

preparation phase; the implementation phase; and the sustaining phase. Detailed inputs, processes, and outputs in each of the three phases were identified and their respective flows were drawn by the use of DFD modelling techniques. The following describes the DFD model separately for each of the three phases.

8.4.4.1 Preparation phase

The key processes involved were: development of vision; development of policy to achieve the vision; development of implementation plan; and development of necessary resources. The company's strategic goals were first established, following which appropriate policy and implementation plans were developed to achieve the vision. Before the actual implementation of the plan, necessary resources required for the implementation were analysed and ensured that they were in place. Resources development was an ongoing process, which was continuously addressed throughout the three phases of implementation.

The data description of the preparation phase of the implementation model of company-B is as follows (see Figures 8.20 and 8.21).

DEVELOP VISION (*Entry type:* Process)

Specification: This process deals with the following data: new strategic directions and ideas; suggestions/comments; and vision. The Dream Team was responsible for developing company level vision. Suggestions and comments from employees over the vision were invited and used for further development. Finally, the vision statement was distributed to all employees of the entire organisation.

NEW STRATEGIC DIRECTIONS AND IDEAS (*Entry type:* Data element)

SUGGESTIONS/COMMENTS (*Entry type:* Data element/employees offered suggestions and comments on the vision)

VISION (*Entry type:* Data element/the final vision)

VISION STATEMENT (*Entry type:* Transient document)

DEVELOP POLICY (*Entry type:* Process)

Specification: This process deals with the following data: various policies and options; suggestions/comments; and policy. The Dream Team developed suitable empowerment policy to achieve the vision. Suggestions and comments for improving the policy were sought from employees and used for producing appropriate policy for the company. Finally, the company policy was distributed to the entire organisation.

VARIOUS POLICY AND OPTIONS (*Entry type:* Data element)

SUGGESTIONS/COMMENTS (*Entry type:* Data element/Employees offered suggestions and comments on the policy)

POLICY (*Entry type:* Data element)

POLICY STATEMENT (*Entry type:* Transient document)

DEVELOP IMPLEMENTATION PLAN (*Entry type:* Process)

Specification: This process deals with the following data: implementation strategies and plans; policy; involvement; and plan. The Dream Team was responsible for developing a suitable plan for implementing empowerment. Regional Management Teams were involved in assisting the Dream Team in producing the plan.

IMPLEMENTATION STRATEGIES AND PLANS (*Entry type:* Data element)

INVOLVEMENT (*Entry type:* Resource element)

PLAN (*Entry type:* Data element)

IMPLEMENTATION PLAN (*Entry type:* Transient document)

DEVELOP RESOURCES (*Entry type:* Process)

Specification: This process deals with the following data: required resources; major resources for approval; minor resources; approved major resources; members for

Resources Development Committee; resources provided; financial estimate; and resources. Resources required for the implementation were assessed at all levels of the organisation (see Figure 8.21). The Dream Team had assessed the implementation plan for any changes in organisational structure, fund availability, and any other resources effective implementation. Employees or departments were also encouraged to report any resources that they required for implementation to the Regional Management Team. The minor resources were solved by the Regional Management Team, and the major requirements passed on to the Dream Team. For major resources, the Dream Team established a Resources Development Committee, members of which were mostly drawn from senior management level. This was provided with the required major resources and requested to come with feasibility of providing them. The Finance department assisted this Resource Development Team with financial estimates for the provisions. Finally, the Resources Development Team provided the feasible resources to respective employees or departments.

REQUIRED RESOURCES (*Entry type:* Data element)

MAJOR RESOURCES FOR APPROVAL (*Entry type:* Data element)

MINOR RESOURCES (*Entry type:* Data element)

APPROVED MAJOR RESOURCES (*Entry type:* Data element)

MEMBERS FOR RESOURCES DEVELOPMENT COMMITTEE (*Entry type:* Resource element)

RESOURCES PROVIDED (*Entry type:* Data element)

FINANCIAL ESTIMATE (*Entry type:* Data element)

RESOURCES (*Entry type:* Resource element)

8.4.4.2 Implementation phase

The DFD model of the implementation phase can be seen in Figure 8.22. Implementation started with the Dream Team conducting several 'Induction workshops' to make employees aware of the principles of empowerment and teamwork, and train them on problem solving techniques. Following the workshops, interested Regional Management Teams expressed their commitment to implement empowerment within their region, and subsequently sought feedback from employees. After this decision, all employees within the region were given initial training by the Training Department. Sufficiently trained employees were authorised as 'process owners' for respective processes they perform. Employees' involvement and attitudes were continuously tracked through periodic survey. Grievances and problems relating to their jobs were solved continuously by the Regional Management Team.

The data description of the model (see Figure 8.22) of the implementation phase of company-B is as follows.

INDUCTION WORKSHOPS (*Entry type:* Process)

Specification: This process deals with the data 'awareness, problem solving and teamwork techniques'. A series of workshops were conducted, where employees were trained on principles of empowerment, teamwork, and problem solving techniques. The Dream Team was responsible for this process.

AWARENESS, PROBLEM, AND TEAMWORK TECHNIQUES (*Entry type:* Data element)

INITIAL TRAINING (*Entry type:* Process)

Specification: This process deals with the following data: training needs; training topics and learned knowledge; initial assistance; training needs and training strategy; training

topics; members to conduct training; feedback; and trained employees. The Training Department sought training needs from employees, and accordingly, devised appropriate training strategies, training topics, and provided for members to train employees. Prior to this, external Consultants were appointed to assist the Training Department in devising suitable training strategies for the company. Finally, sufficiently trained employees were authorised as Process Owners to act as empowered employees with little supervision. Effects of training and details of trainings were reported to the Culture and Learning Department.

TRAINING NEEDS (*Entry type:* Data element)

TRAINING TOPICS AND LEARNED KNOWLEDGE (*Entry type:* Data element)

TRAINING NEEDS AND TRAINING STRATEGY (*Entry type:* Data element)

TRAINING TOPICS (*Entry type:* Data element)

FEEDBACK (*Entry type:* Data element)

INITIAL ASSISTANCE (*Entry type:* Resource element)

MEMEBERS TO CONDUCT TRAINING (*Entry type:* Resource element)

TRAINED EMPLOYEES (*Entry type:* Resource element)

EMPLOYEE INVOLVEMENT (PROCESS OWNERSHIP) (*Entry type:* Process)

Specification: This process deals with the following data: periodic employees' survey (questionnaires); satisfaction and grievances; assistance and solutions to employees' problems; survey results. The Regional Management Team was responsible for continuously encouraging employees to be involved in their process improvements. To show its commitment to empowerment, the Regional Management Team continuously assisted employees in solving their problems. To assess employees' attitudes and satisfaction towards their involvement, the Regional Management Team periodically conducted surveys with employees, and reported the results back to them.

PERIODIC EMPLOYEE SURVEY (QUESTIONNAIRES) (*Entry type:* Data element)

SATISFACTION AND GRIEVANCES (*Entry type:* Data element)

ASSISTANCE AND SOLUTIONS TO EMPLOYEES PROBLEMS (*Entry type:* Resource and Data element)

SURVEY RESULTS (*Entry type:* Data element)

8.4.4.3 Sustaining phase

Following the initial training and involvement of employees and their subsequent process ownerships (during the implementation phase), the company continuously strove to make the empowerment approach persistent within the company. This included: Regional level Management continuously learning about expectations and problems from external sources (customers and suppliers); departments or sections continuously developing improvement plans; employees developing and implementing improvements within their own processes; recognition of employees' accomplishments by the management; and company level performance measurements performed periodically by the senior management (see Figures 8.23 and 8.24 for DFD models of the sustaining phase). The data description of the DFD model of the sustaining phase is as follows.

PERIODIC SURVEY/MEETINGS (*Entry type:* Process)

Specification: This process deals with the following data: permanent customers/suppliers; and expectations/problems. Lists of potential customers and suppliers were maintained at regional level, and the Regional Management Team, periodically, conducted both surveys and meetings with them to identify their requirements and problems on the service provided by the company. The problems identified from this exercise were used for company level improvements.

PERMANENT CUSTOMERS/SUPPLIERS (*Entry type:* Data element)

EXPECTATIONS/PROBLEMS (*Entry type:* Data element)

CUSTOMER/SUPPLIER FOLDER (*Entry type:* Data store)

PROCESS IMPROVEMENT BY DEPARTMENT/SECTION (*Entry type:* Process)

Specification: This process deals with the following data: expectations/problems; department improvement plans; involvement in department improvement plans; plans for improvement; and feedback. Based on expectations and problems perceived from the 'Periodic survey/meetings' process, several departments within regional levels developed department level improvement plans. During this process, employees, within departments, were encouraged to be involved in the developing plans. Also, Regional Management Teams were consulted for suggestions and progress regarding improvements reported to them. After several iterations, the final improvement plan was distributed to employees within departments.

DEPARTMENT IMPROVEMENT PLANS (*Entry type:* Data element)

INVOLVEMENT IN DEPARTMENT IMPROVEMENT PLANS (*Entry type:* Resource element)

PLANS FOR IMPROVEMENT (*Entry type:* Data element)

FEEDBACK (*Entry type:* Data element)

SELF DEVELOPMENT SYSTEM (*Entry type:* Process)

Specification: This process deals with the following data: invitation to partners; agreement to participation; agreement signed; vision; assistance/comments/suggestions; personal vision; assistance/training; plans for implementing vision; survey on performance; performance; suggestions through survey; problems and performance (see Figure 8.24). In this process, employees identified dissatisfaction or discomfort related to their current state, and diagnosed themselves in terms of why they were currently dissatisfied and how to move forward from that state. This included the adoption of departmental level improvement plans within their processes, and resulted in the development of self-vision. Everyone needed to have a partner who was either a manager, supervisor, colleagues, or friend to listen and assist in discovering solutions. The self-vision continuously enabled individuals to identify problems within their processes and training needs to improve them.

The Training Department continuously assisted in this aim. Problems identified were assessed and solutions implemented with the assistance of partners. Finally, a 360 degree appraisal survey was conducted to both assess self-improvements and identify further problems for improvement. This survey was conducted with relevant participants (colleagues, external customers and suppliers) around individuals. Results of the survey were reported to the Regional Management Team.

INVITATION TO PARTNERS (*Entry type:* Data element)

AGREEMENT TO PARTICIPATION (*Entry type:* Data element)

AGREEMENT SIGNED (*Entry type:* Data element)

SELF-DEVELOPMENT VISION FOLDER (*Entry type:* Data store)

VISION (*Entry type:* Data element)

PERSONAL VISION (*Entry type:* Data element)

ASSISTANCE/COMMENTS/SUGGESTIONS (*Entry type:* Data/resource element)

ASSISTANCE/TRAINING (*Entry type:* Data/resource element)

PLANS FOR IMPLEMENTING VISION (*Entry type:* Data element)

SURVEY ON PERFORMANCE (*Entry type:* Data element)

PERFORMANCE (*Entry type:* Data element)

SUGGESTIONS THROUGH SURVEY (*Entry type:* Data element)

PROBLEMS AND PERFORMANCE (*Entry type:* Data element)

AWARD CEREMONY (*Entry type:* Process)

Specification: This process deals with the following data: identified accomplishments; and awards/thanks. From the above self-development system, best accomplishers were identified by the Regional Management Team and were awarded gifts or a prize.

IDENTIFIED ACCOMPLISHMENTS (*Entry type:* Data element)

AWARDS/THANKS (*Entry type:* Resource element)

BENCHMARKING (*Entry type:* Process)

Specification: This process deals with the following data: company level performance; results; periodic survey; performance; and financial statement. A separate Benchmarking Team established at company level, gathered performance data from regional management and financial performance from finance departments, to benchmark the company's performance with external competitors by conducting periodic surveys with competitors. Results of this exercise were distributed to both the Dream Team and employees.

IDENTIFIED ACCOMPLISHMENTS (*Entry type:* Data element)

PERFORMANCE (*Entry type:* Data element/regional level performance)

COMPANY LEVEL PERFORMANCE (*Entry type:* Data element)

FINANCIAL STATEMENT (*Entry type:* Data element)

PERIODIC SURVEY (*Entry type:* Data element)

RESULTS (*Entry type:* Data element)*Entry type:*

Figure 8.20. Level 1 DFD - Preparation phase (Company B)

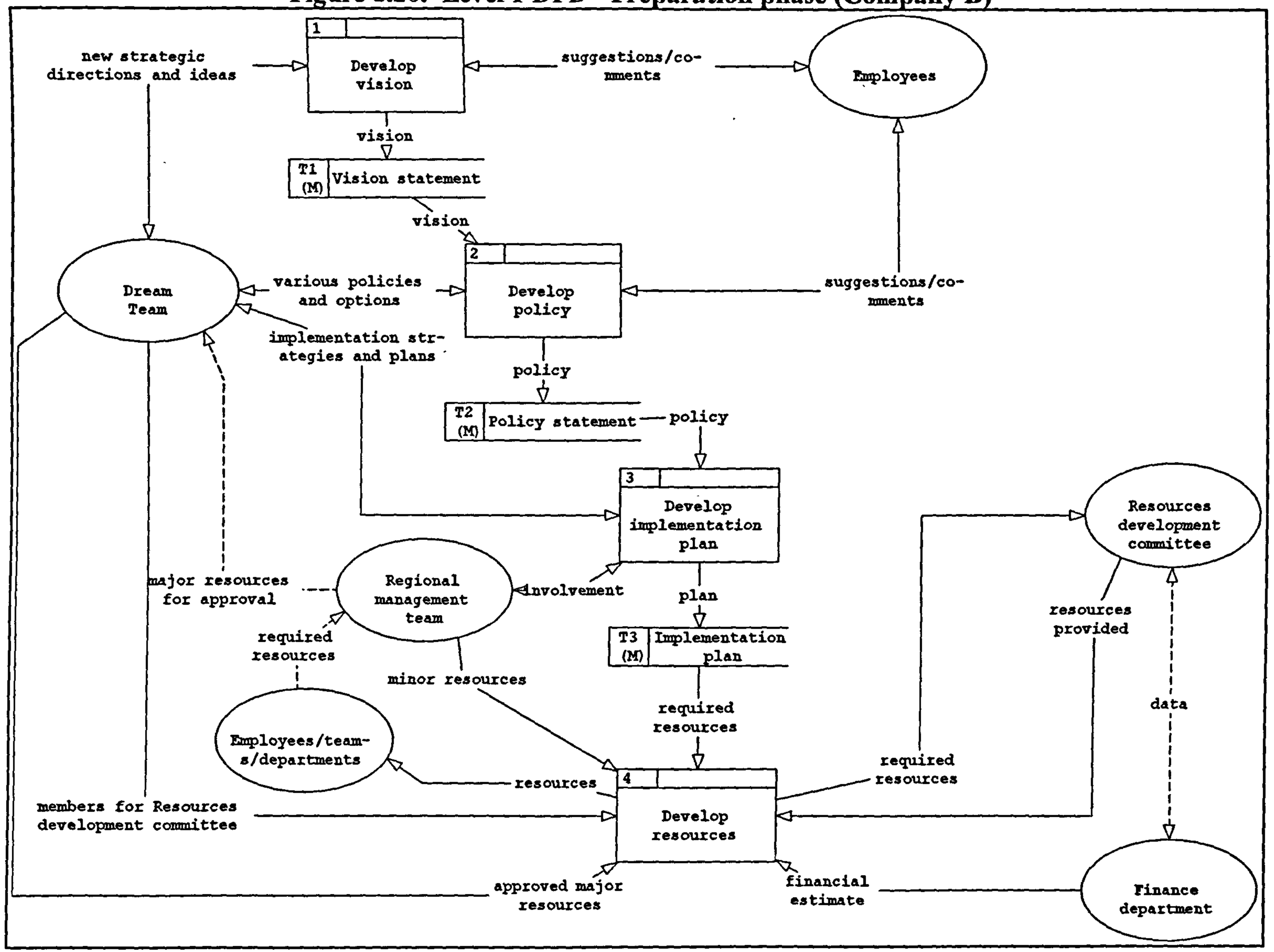


Figure 8.21. Level 2 DFD - Preparation phase - Resources development (Company B)

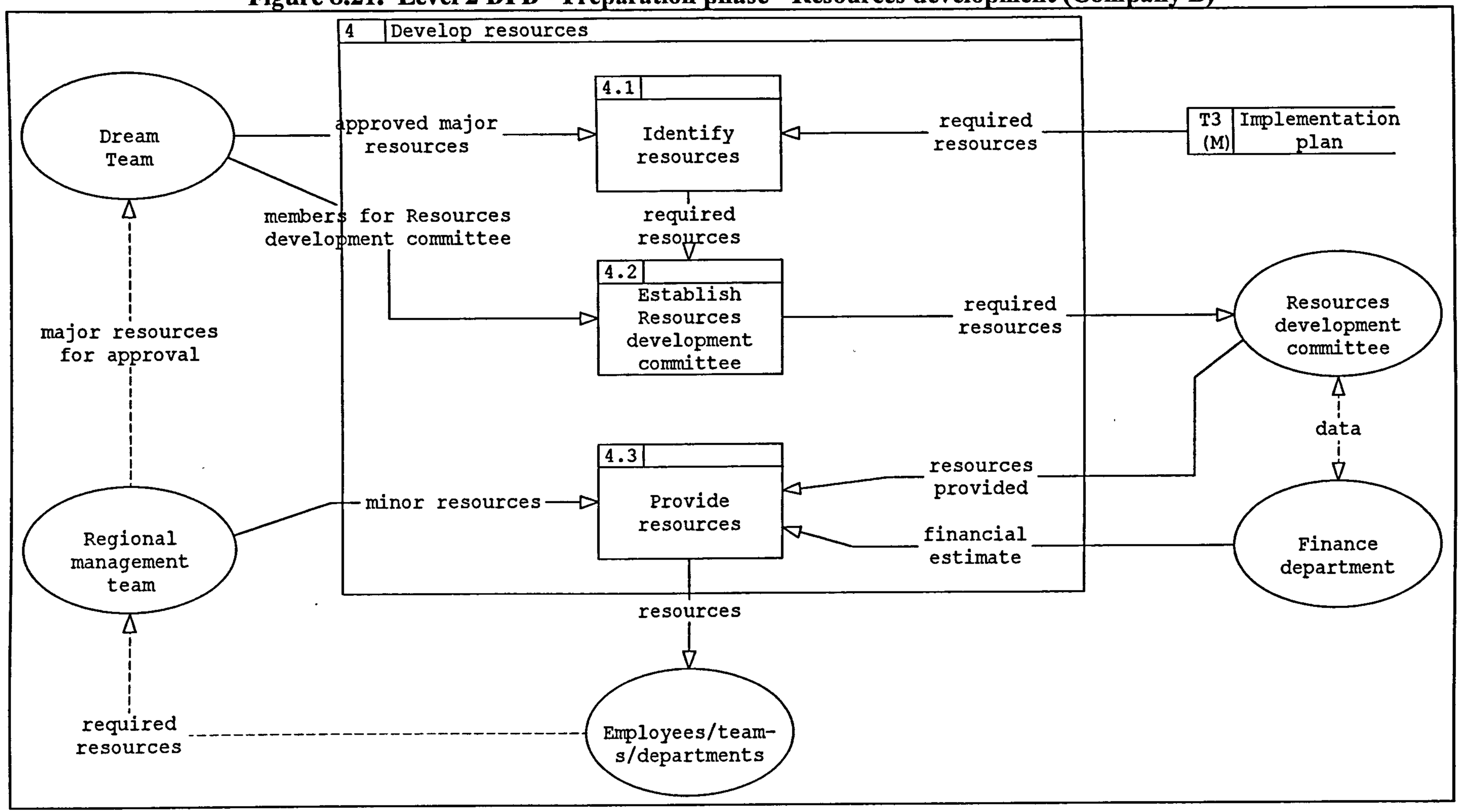


Figure 8.22. Level 1 DFD - Implementation phase (Company B)

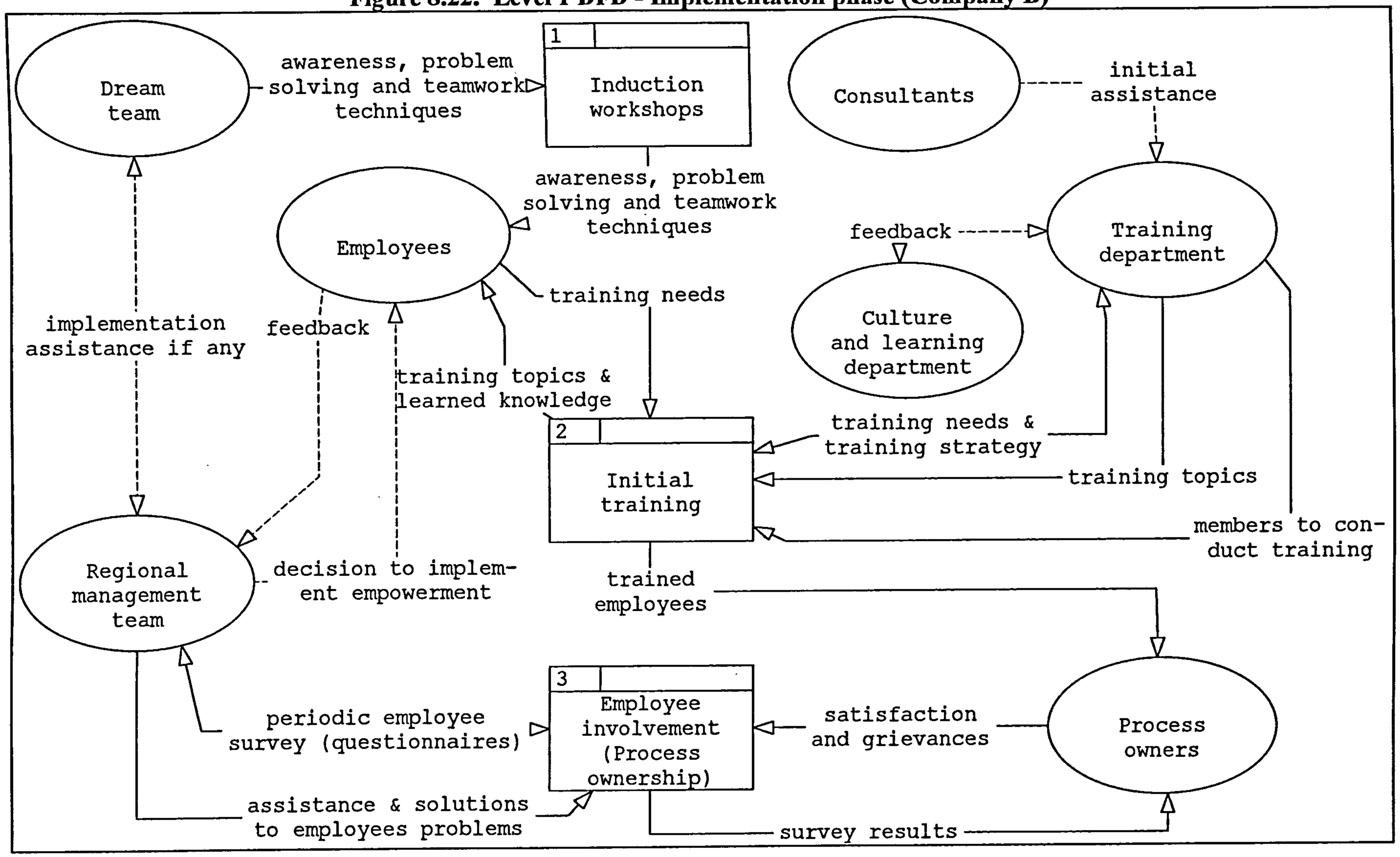


Figure 8.23. Level 1 DFD - Sustaining phase (Company B)

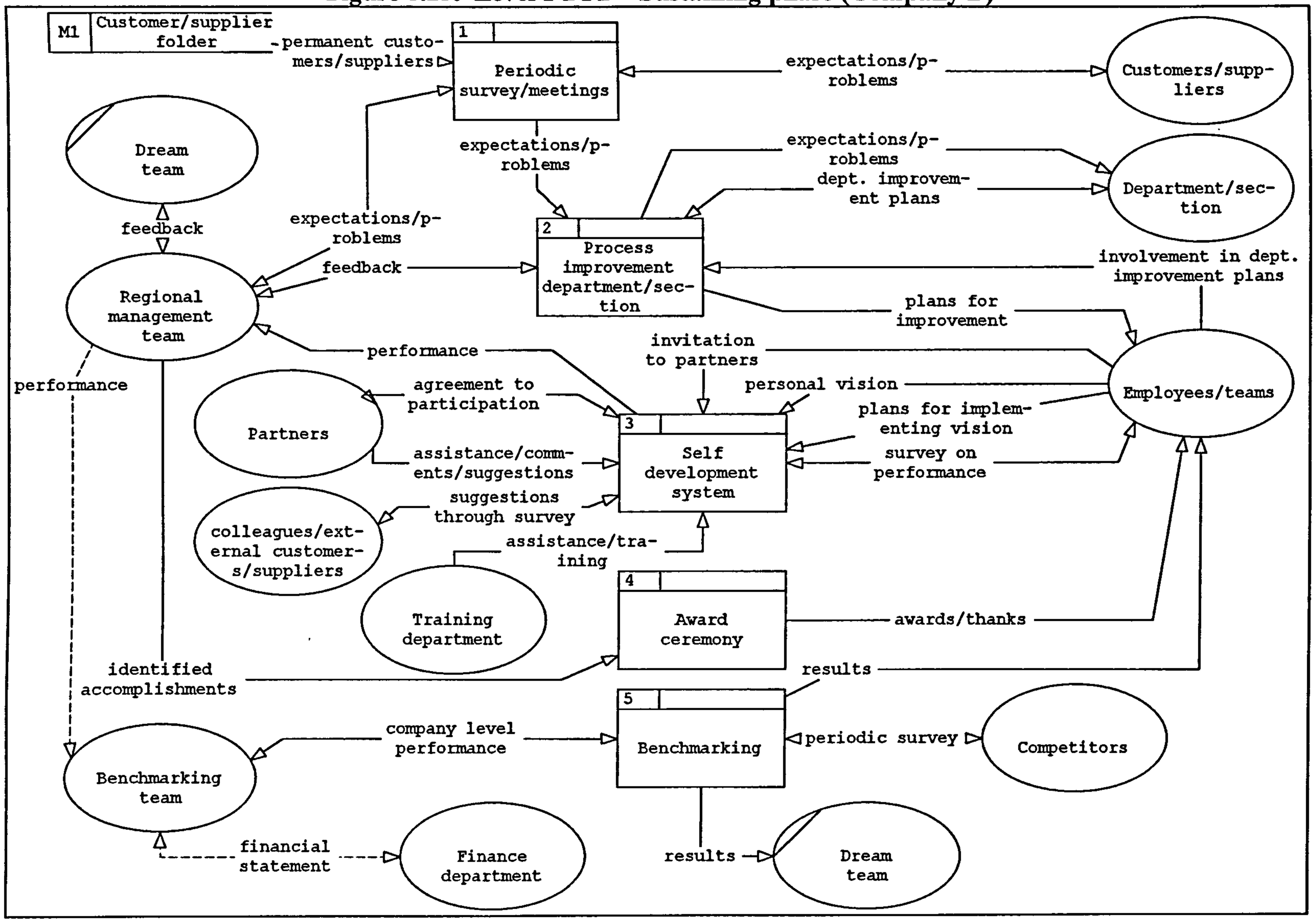
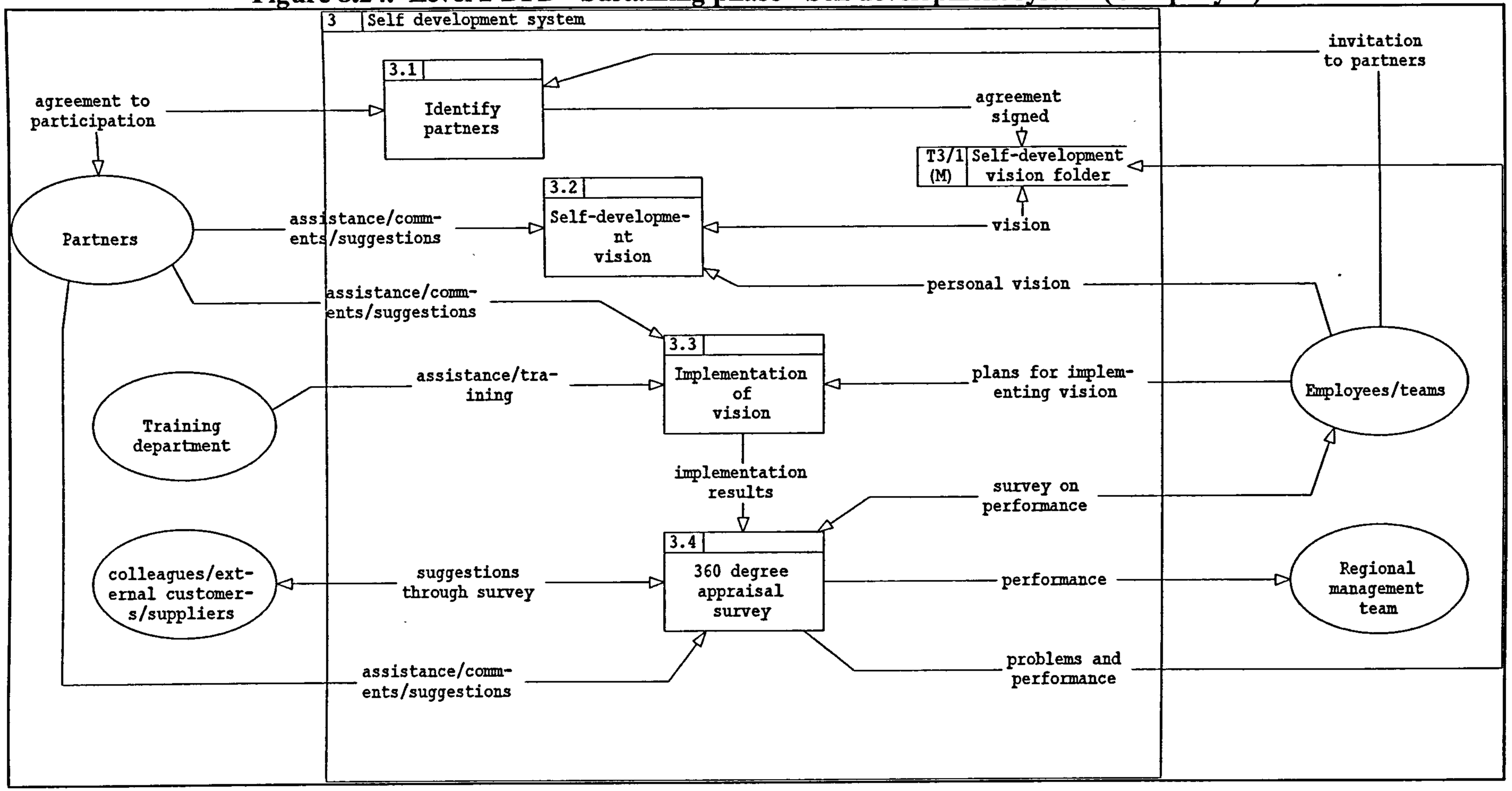


Figure 8.24. Level 2 DFD - Sustaining phase - Self development system (Company B)



8.5 Case study 3: Empowerment implementation in Company-C

Company-C is one among seven subsidiaries of a major holding company. Both the subsidiary and holding company concentrate mainly on construction activities. Company-C operates in the south west region of the UK, having operating units at Bournemouth, Bristol, Cheltenham, Oxford, and South Wales. The company is a fully autonomous division of its holding company, where the strategic decisions are carried out within the subsidiary itself. It is a member of the Confederation of Building Employers and the British Quality Foundation. It registered with the British Standards Institution to BS EN ISO 9001 in 1994. It has attained the "Investors In People Standard" and has won a number of National awards for its training programmes.

The holding company was founded in 1822, incorporated in 1903 and became a public company in 1925. It operates throughout the UK and overseas, mainly in the area of civil and building engineering; other functions include: services; facility management; environmental services; project investment and property. The overseas operations include: North and South America; Europe; The Middle East; The Far East; Australia; and Africa.

Total employees of company-C is 400 and its holding company is approximately 13000.

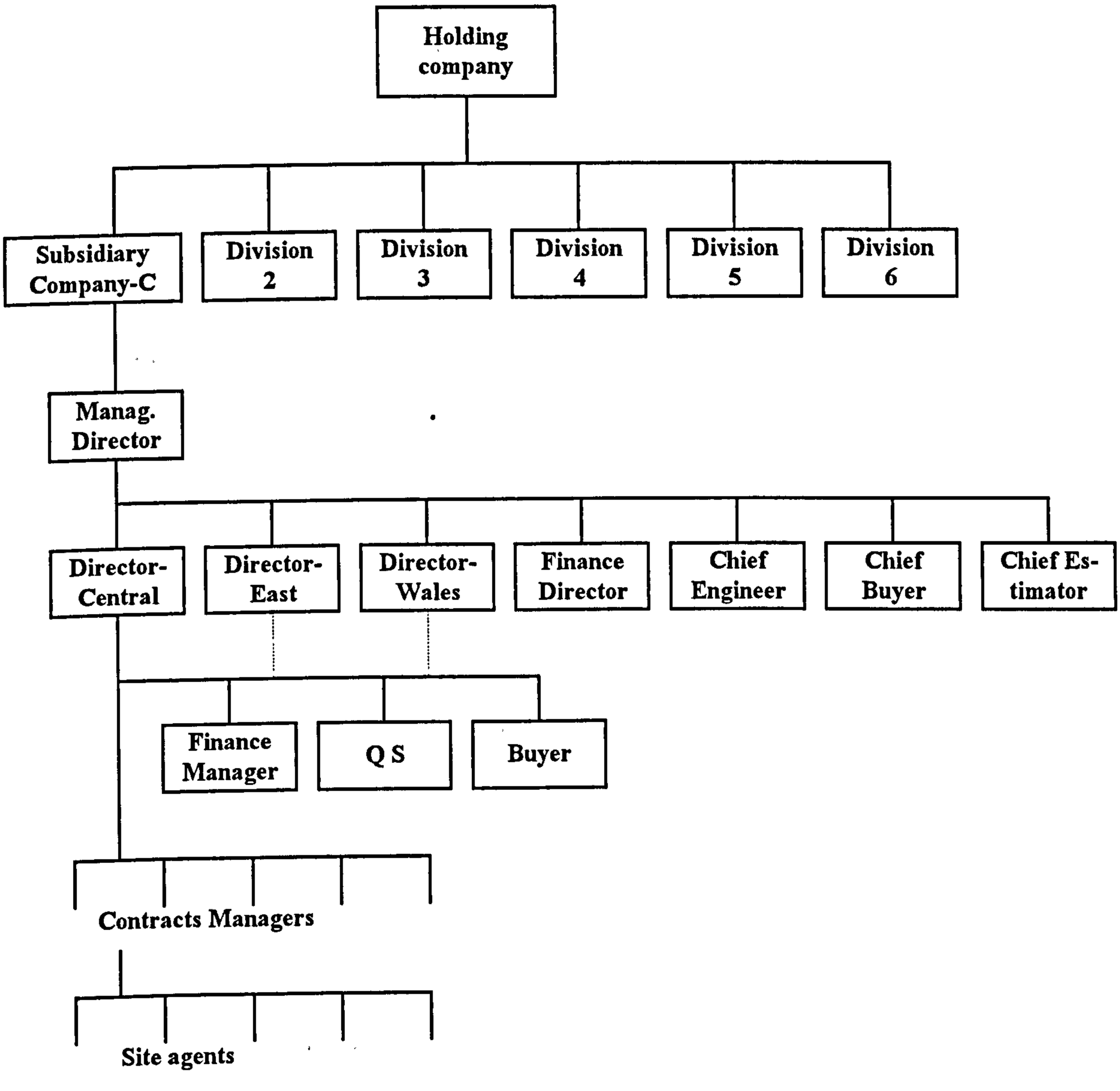
Company turnover for recent years is around £75 M as follows:

Year	*Turnover in millions (£)*	
	Company-C	*Holding company*
1993	70	1342
1994	76	1355
1995	75	

8.5.1 Organisation and company policies

The management structure can be classified under three major levels: strategic (the Main Board); operational (middle level); and direct work (site level) (see Figure 8.25).

Figure 8.25. The organisational structure of Company-C



The Main Board includes the Chairman/Managing Director, Financial Directors, Regional Directors, Chief Engineer, Chief Buyer, and Chief Estimator. Group performance and strategic objectives and plan are established by the Main Board. The regional units are led by Regional Directors and the Regional Management Team comprising Finance Manager, Quantity Surveyors, and Buyers. This team is responsible for the control of projects within their jurisdiction. Site level employees are Contracts Managers, site agents, and very few operatives. As in the previous case companies, this company holds a negligible number of directly employed operatives at site. Sub-contractors are employed to control their own operatives.

Company policies

All employees in each territory have equal opportunities within their own fields. Appropriate employment policies are developed in each country or region to comply with the requirements of the country's law and to suit local conditions.

The company recognises the importance of good communications and relations with employees. The group, which comprises many businesses is decentralised and each subsidiary's management is therefore directly responsible for the development of employee participation practices (to suit the size and needs of each business). Each employee receives periodic copies of a house journal, and staff representatives serve as trustees in the administration of certain pension schemes. Employees are also encouraged to become aware of and promote, the overall work and performance of the group.

Health and safety is as important to the Board as any other discipline within the group. A programme of new systems implementation and independent audits continues and is indicating positive results. The group Health and Safety Committee meets quarterly to supervise the performance of its businesses to ensure compliance with its legal obligations

and company policies. A programme of adopting and implementing policies for environmental management across the group also continues to be extended.

8.5.2 Background to empowerment and quality in Company-C

The company began a quality policy in 1986, which was updated several times to cope with the changing needs of the industry. In commitment to the quality policy, the company was the first contracting organisation registered for BS 5750 in May 1988. Copies of quality policies have been distributed to all employees in two ways: new employees were served with their terms and conditions of the appointment; and existing employees were served with their monthly pay slips. The current quality policies are to:

- develop and implement a continuous improvement process and to produce the best possible service and product for all customers by using a Total Quality Management framework;
- achieve customer satisfaction by completing contracts to the required quality on time and within budget;
- identify areas of defect within the product and services and eradicate their causes through training and teamworking; and
- integrate the well established BS EN ISO 9001:1994 Quality Management System into the TQM system. The company recognises that to satisfy its quality policy it requires the close co-operation of all employees, customers, consultants and suppliers.

In order to achieve the above objectives the company started implementing TQM in 1992. Reasons for this implementation were: rekindle team/family culture; competitive edge; enhance individual responsibilities; increase bottom line profits; QA achieved in 1988; restructure at the end of 1991; and failure by 1000 initiatives. The main objectives for the

implementation of TQM include: identifying their customers; meeting customer requirements; seeking feedback on performance; identifying defects, errors and other opportunities for improvement; continually improving performance and enhancing customer service. To achieve these objectives, the company decided to adopt a policy of employee empowerment. The main reasons have been to: involve employees in the business; enable employees to arrive on best solutions to their problems; achieve better job satisfaction; and consequently achieve business profits. The policy of empowerment was introduced at the same time when TQM was started.

8.5.3 Empowerment implementation in Company-C

8.5.3.1 Leadership

The leadership style of the company has been developed into a participative one, where all managers and supervisors involved in the process jointly work with their sub-ordinates. At strategic level, the Board of Directors called the 'Quality Management Team' (QMT), comprised of the Managing Director (MD), five Directors and two senior management staff including the Chief Engineer. The MD chaired the QMT and produced the company vision with the assistance of members of the QMT. The vision statement is as follows:

The vision

- To make the construction process an enjoyable and rewarding experience for all parties
- To increase our repeat order business by quality work, delivered on time and within budget
- To identify and eradicate defects and errors as part of normal business practice.

To achieve the above vision the QMT produced the following objectives:

- Train every staff member in TQM
- Ensure quality is as important as time and money
- Reduce the cost of defects by at least 10 per cent each year
- Involve all employees, customers and suppliers in TQM
- Use TQM to enhance the profits of the company
- Secure 7.5 per cent of the available construction market
- Be the first choice of any client procuring construction.

In order to enforce this vision throughout the organisation, several workshops were conducted during the initial stage, where the vision statement was supplied and explained to employees. Subsequently, employees' views and suggestions on the vision were sought. Almost everyone welcomed the initiatives. In order to show commitment to the desired change, regular meetings between top and lowered levels of the organisation, conferences, and MD's personal contact with the employees (during walkthroughs) were conducted. These included: providing all necessary resources to the work situation, improving employees' skills, and continuous monitoring of progress.

Leadership existed at all levels of the organisation. All managers and supervisors acted as leaders, besides which, Leaders were identified for several kinds of teams that were formed around different levels of the organisational tree. Team leaders were selected by team members themselves with the guidance of senior staff. At direct work level, senior operatives like foremen and supervisors were selected as leaders. All leaders were expected to act as role models and champions of empowerment for others to follow. In order to act as efficient leaders, employees were trained on leadership skills including: delegation; communications; interpersonal skills; co-ordination, and team building. These skills were applicable to all level leaders, however, the required mix of skills varied with

respect to the hierarchy; being very high at strategic level leaders and low at site level leaders.

8.5.3.2 Empowerment system

The empowerment policy was initiated as part of TQM by the new M.D appointed in 1991. He established an implementation strategy at QMT level. Consequently, the implementation plan was developed by the QMT. The plan included several aspects of the implementation system: training, involvement strategy, resources development, and monitoring procedures. According to the plan, initially, the programme was started with two day training courses on quality and empowerment activities. These training were offered by the eight senior management personnel already trained by external consultants. Then the implementation began by starting from the higher level of the organisation towards the lower level, using a step by step approach. After the successful implementation in one level, the next level was considered. The QMT steered the implementation process throughout the organisation. This team met fortnightly and discussed the progress and effectiveness of implementation. Several Quality Action Teams formed at the lower levels of the organisation have facilitated the implementation of empowerment at lower levels. These teams were represented by atleast one member from the QMT for advice.

As part of the system, several surveys including employee surveys, customer surveys, and cost of quality surveys were performed to assess effectiveness. Based on the results obtained, some modifications were made in the empowerment system. The empowerment system was implemented throughout the organisation in a total of 18 months. No separate work instructions were produced for implementing empowerment, and the system became very informal and flexible. Superiors and managers worked jointly with their sub-

ordinates and assisted them in solving their specific empowerment problems. In addition, the QMT and QATs have facilitated everyone in the organisation adopting empowerment. The only one organisational characteristic that affected the empowerment implementation plan was geographical dispersion of the operating units (in communicating and organising).

8.5.3.3 Resources development

The fundamental resources perceived as necessary for the implementation of empowerment were funds, organisational restructuring, and time. The QMT was mainly responsible for continuously monitoring that resources were provided at the point of need.

Organisational restructuring was performed only with a view to establishing cross-functional teams and self-managed teams without much alteration in the existing organisational structure. At department level, several teams were formed around their functions. For instance, the estimating department formed teams comprising groups of estimators including the senior and junior level estimators. This enhanced the communication among them and reduced levels of hierarchy within the organisation. These teams were fully empowered to act within their functional processes. These types of teams were formed down to the site level. At site level, operatives were grouped in terms of gangs each for concreting, brick laying, pipe laying etc., and encouraged to work as teams. However, because of discontinuity of the work, these teams were not fully empowered. Also, another reason was that the company employed a smaller number of temporary operatives to undertake construction works. The Quality Improvement Teams established at all levels of the organisation encouraged cross-functional process improvements, where members from different disciplines worked jointly for process improvement. In order to achieve empowerment at site, the QMT has planned to

restructure some of the processes that the company satisfied via sub-contractors and suppliers. The QMT identified that sub-contractor management (including selection process, monitoring at site, and payment procedures) should be reorganised so as to achieve the company's vision at the site. After the identification of this problem, the QMT delegated the task to a Quality Action Team (QAT) comprised of members of both senior and middle levels of the organisation. Currently, this team is exploring this process, and once it is rearranged, it will be submitted to the QMT for approval. Then the appropriate implementation will begin.

The QMT requested each and every department (and teams) to analyse their working conditions for improvement. However, this was not a one-off process; whenever there was a need identified by the department/individual for improving a working condition, it was reported to the QMT for approval. The QMT, after receiving such suggestions, with the assistance of the finance department, analysed and sanctioned those provisions. For example, at office level, a separate smoking room was provided to enable smokers to smoke without disturbing the working environment. At site level, a canteen, toilets, and improved accommodation were provided. The resources development activities included physical redesign of the head office, where, the accounts office and seating arrangement were changed, and some senior managers' offices were rearranged in order to improve communication within the QMT. To enhance communications among employees, the head office, regional units, and sites were integrated through a computer network (e-mail system), which was totally designed and implemented by in-house experts.

Finance for resources development and training were achieved through several means; mainly from company revenue, and partly by grants obtained from Construction Industry Training Board, and Local Training and Enterprise Council. The QMT was responsible for allocating the funds for development activities with the assistance of the finance

department. Employees were also allowed to use funds for improvement activities without the approval of top management, however, it depended on the cost and nature of the business. This process was achieved through the department's annual budgets, which were prepared by each department for every consequent year and submitted to QMT for approval. The department was empowered to use the approved budget for any improvement activities, including empowering individuals or teams within the department and for miscellaneous expenses such as printing forms or notices and purchasing some minor equipment, etc. If it was a major estimate, teams/departments/individuals were required to submit cost benefit analysis for the change and/or provisions to the QMT, which in turn assessed the validity of the requirement before sanctioning them. The finance department assisted in analysing cost benefits of the proposals.

8.5.3.4 Involvement

The QMT, having established necessary resources and policies, encouraged all departments to implement empowerment. Each Regional Management Team expressed its decision to implement empowerment to employees and sought their feedback. Problems related to the implementation and implementation procedure were offered to employees through training. Initially, some scepticism among employees was found, but, later presentations by top management (describing the benefits of empowerment) enabled reluctant employees to be more enthusiastic. In order to continuously track employees' interest and involvement, the QMT regularly conducted employee surveys and encouraged them to report their grievances. The surveys also included employees attitude and satisfaction on their jobs. Results of the surveys for the year 1992 and 1995 are listed in Table 8.1.

It can be seen from the Table 8.1 that the company's performance has improved since 1992, in terms of improved communication, improved employee involvement, improved employee satisfaction, and improvement in employee understanding of business process. In addition, an Annual Individual Appraisal system included assessment of training skills acquired and performance achieved by individuals. The appraisal process was continuously maintained by an individual's immediate supervisor and reported to the QMT through the Regional Management Team. The QMT assessed those reports and distributed the summary of company level performance results to every individual. A formal grievances reporting procedure was also maintained. Grievances were reported to the individual's immediate supervisor, and the supervisor in turn, was expected to solve those grievances. If the problem was beyond the control of the supervisor, then it was passed on to the QMT, where in conjunction with the Personnel department, they were analysed and solved.

Table 8.1: Results of employee involvement survey for the years 1992 and 1995

Questions	Response in %	
	1992	1995
I consider the TQ process is working		73
My manager is committed to quality improvement.		76
The company learns by its mistakes.		70
My manager is prepared to listen to ideas and suggestions I make	70	85
I feel my manager recognises my efforts at work.	69	80
I believe the company is good at communicating with staff.	13	65
The company's clients are satisfied with the service we give.	74	88
I know what the company's plans are for the future	32	64
I support the future plans for the company.		82
I consider that current company's procedure and systems are effective	58	84
I am satisfied with the induction I received when I joined the company.	49	83
I am satisfied with the opportunities for promotion.	42	47
I consider the company believes my personal development to be of high priority.	48	56
My salary reflects my performance and working conditions.	35	22
Work objectives and deadlines are discussed with me and clearly defined up front	68	81
I understand my roles and responsibilities	68	94
I am satisfied my annual staff interview is worthwhile and productive.	50	65

Customer involvement was considered as crucial to keep them engaged with the company for their projects. For instance, two years ago, the company's Director met one permanent customer. The customer conveyed dissatisfaction over Company-C for lagging 3 or 4 years behind competitors in introducing new management concepts like TQM. The Director was surprised and told the customer that the company had already implemented TQM and empowerment three years ago, and explained the perceived benefits since implementation. At the end of the discussion, the same customer told the Director that the company was 3 or 4 years ahead of its competitors. This indicates that lack of

communication between construction organisations and customers might mislead customers, to look for other organisations who do report them their latest organisational developments. Having realised this, Company-C maintained a list of permanent customers and kept them informed of company progress, changes, and new management initiatives. Customer surveys, and visits to customer's premises were the fundamental means of permanent contact, by which, customers' expectations and satisfactions were assessed. Mainly, Construction Directors and Business Development Managers of the Regional Management Team performed these duties. Improvements made on the results of the customer survey are listed in the Table 8.2.

Table 8.2: Customer survey improvements

- Accept greater responsibility for managing sub-contractors and completing remedial work.
- Less paperwork
- More contact at Director level
- Commit to programme flexibility
- Be less adversarial
- More open book approach with respect to project cost

Suppliers and sub-contractors were involved through various forms: day to day involvement with site level management; and periodic involvement in the overall management of the company's business through a series of meetings, seminars, training sessions, and conferences. Half day workshops were conducted periodically when all the expectations, empowerment processes and consequent benefits were presented to suppliers, and difficulties and problems were shared between the company and suppliers. New initiatives (e.g. empowerment) in the company were always expressed to suppliers only after the full realisation of the benefits. After successful implementation, suppliers were encouraged and assisted to implement the initiative in their own organisations. Most

of the above dealings (except the day to day business involvement) with suppliers was performed by members of the Regional Management Team. Suppliers organisations were also assessed on their management capability in supplying quality product/services by the Buying department through two ways: questionnaire surveys and assessment visits. At project level, both the Site Manager and a representative from the Buying department conducted post contract review and assessed the performance of suppliers and sub-contractors against certain criteria. The results of these review and assessment results were reported to the QMT.

8.5.3.5 Education and training

The major training strategy of the company was skill-based. Skill deficiencies for each employee were identified through both the Annual Appraisal System and discussions between the employee and the supervisor, and accordingly, training was provided to improve their skills. Initially, the top management, including Directors of the Main Board, have undergone training on strategic management at Ashbridge Management College. The training course lasted for 6 weeks, and at the end, trainees were certified for achieving sufficient knowledge on the training modules. Later on, consultants were appointed for developing the training strategy for the company, and eight individuals (internal trainers) from both the top (including the personnel department) and middle management were trained by consultants through six day workshops. Then, both the middle and lower levels of the organisation underwent training through a series of workshops conducted by Internal Trainers. The operational level staff have received training on health and safety, leadership, presentation skills, letter writing, reporting, and time management. The employees of direct work (site) were mainly trained on health and safety and on their relevant business activities.

No formal training department existed for managing the training activities, however, a separate Training Co-ordinator was appointed to co-ordinate and report the training activities and their effectiveness to both the QMT and Personnel department. The training needs were identified from both the annual appraisal record maintained for all individuals by their immediate supervisors and discussions between supervisors and individuals. These training needs always aimed to achieve the overall goal of the business. Needs identified from the appraisal for every individual were reported to the Personnel department. The Personnel department sorted out the training needs for groups of individuals and reported to the Training Co-ordinator, who in turn organised the training and respective modules. Based on the list of needs, both group and individual training were offered to employees, conducted at office and site. For instance, site level employees were trained on health and safety at the office, which made them feel fresh in a different environment. The effects of training were evaluated by the appraisal system. For example, the safety training effects were measured by tracking number of accidents, which were performed by immediate supervisors. In order to find that the training skills were actually applied at the work place, supervisors had frequent discussions with employees. Results of the evaluation of the training effects, for individuals, were kept confidential between the management and the individual. Based on satisfactory performance after the training, employees were certified for having acquired sufficient skill and knowledge to manage their training themselves. After certification, employees were required to manage their training themselves: by diagnosing their training needs and reporting to the personnel department; and assessing the training effects at the work place.

Besides the formal training system, display boards, posters, and news letters were used to constantly keep employees aware of empowerment improvement activities and benefits. The QMT was responsible for these activities.

Suppliers and sub-contractors were also offered training in the area of safety and total quality through several one day workshops. These were performed by the QMT.

8.5.3.6 Teamwork

Teamwork was adopted at all levels of the organisation. At top level the board of directors were formed into a team called QMT. At lower levels, several Quality Improvement Teams (QIT) were established with respect to their functional roles. These were permanent teams, empowered to: identify defects/problems; develop solutions for solving them; implement the finalised solutions, and check the effectiveness of solutions. The team leaders were chosen by the team itself. These teams met regularly, discussed issues, and set goals for process improvement. Delegated teams were also established by the QMT, called Quality Action Teams (QAT), to address specific problems identified by the QMT. These teams were given problems and delegated to analyse and solve them. Once the problem was solved these teams were dissolved or assigned the next job (problem). Both the QITs and QATs report to the QMT.

At direct work level, teams were formed around their operations (called work teams). The life of these teams were highly influenced by the duration of the project and transient nature. Since the company did not directly appoint operatives at site, these teams were only established in the maintenance works. Teams comprised of interdependent jobs like concreting, brick laying, and carpentry. Supervisors became leaders of these teams, and assisted them in setting targets and solving problems.

8.5.3.7 Process improvement

Both individuals and teams were empowered as owners for their processes once they acquired sufficient skill and knowledge and subsequent certification for their competence. The QITs established at all levels of the organisation were examples of team ownership. These teams took decisions and further improvement activities within their business functions. Team members contributed to improvements of the processes the team owns. Individual owners were strictly restricted to take decisions that affect others' processes or performance. If there was any impact or problem caused by such decisions, the affected owners reported back to the particular owner who implemented the decision for further investigations. By doing this, individuals contributed to the improvement of others processes. Another criteria that was considered crucial was cost-implications of employees' decisions on process improvement. Since individual process ownership was at an initial stage, the process evaluation system and reporting procedures were not well established. However, teams were obliged to forward their process evaluation report in terms of cost-benefit analysis to the Regional Management Team for approval. The statistical tools used in this process included: brainstorming; pareto analysis; experimentation; and impact and trend analysis. The impact and trend analysis is some kind of cause and effect analysis which was used to evaluate the effectiveness of the decision being implemented. All of the above progress was documented in the appraisal folder.

The head of each department, with the assistance of department senior staff, produced improvement plans, annually, for department level performance improvements and reported to the Quality Management Team. These plans included the objectives, targets and desired action plans for the next consecutive year. These plans were developed based on problems emerged from External survey/meetings.

There were no significant plans produced at site level for performance improvements. Usually, site managers and other agents participated in work teams to solve their problems. For every project, plans including the anticipated problems and solutions were produced by a group of site level staff including Site Manager, Assistant Site Manager, and Engineers. This team continuously tracked the plan for progress at site level by conducting an half an hour meeting every day and discussing issues related to the achievement of the plan.

8.5.3.8 Measurement

Performance criteria for assessing improvements varied with respect to various levels of the organisation. The top management measured strategic level performance indicators such as percentage profit of turnover, employee attitudes, customer base, and so on. These measures are performed by the QMT with the assistance of the finance department. At operational and direct work levels, progress against a programme or plan (e.g. time and cost) were measured, which included: cost against value; wastage on site, and rework. At site level, these measures were performed by the site manager and site teams. Sometimes QATs were formed to measure the department level and section level improvements (see Table 8.3 for some of the results). All of these measures were usually taken from several documented records maintained by individuals and/or departments, and appraisal system. These documents were disposed of after 12 years time.

The main tool used to assess performance of individuals was an Annual Appraisal System. The performance appraisal record maintained for each individual by his/her immediate supervisor, contained details of individual's performance such as improved skills, reduced waste or rework at work, and reduced complaints were assessed annually and reported to the QMT, which, in turn, analysed those appraisals and published the accomplishments

company wide. In addition, the QMT conducted surveys annually with employees and customers to identify their views on company performance, quality delivery, satisfaction, and management support. See Table 8.4 for customer survey results.

Table 8.3: Performance measurement by QATs

- Late material requisitions - reduced from 56.6% in March 1994 to 20% in January 1996 (on £10m of materials)
- Theft of small tools - reduced from £108, 000 per annum to £60, 000 per annum
- Late receipt of retention - £1.484m in January 1994 to £880K in January 1995. £1m in January 1996
- Delay in agreement of final account - £3.7m in February 1994; £2.5m in September 1995; £2.1m in February 1996
- Reduction in photocopying by using new equipment - £13.5k at Head Office
- New telephone system at Head Office - £20k saving on rental
- Design and build procurement errors - £180k saved during 1995
- Sub-contractor system improved to remove difficulties with VAT should sub-contractor not pass VAT to Customs & Excise. Company-C overcharged £26, 000 which has since been returned
- Reduction in insurance premiums £150,000 p/a (less cost of excess of £35k)
- Revising of corporate identity stationary - saving of £30,000 in Company-C - in excess of £100,000 in southern division
- Twenty per cent more invoices processed
- Rejected invoices reduced from 600/month to 400/month
- Estimating success rate increased from 1:6.2 to 1:4.3
- Increased negotiated work from 25% to 40%

Table 8.4: Customer survey results

	(Rating 1-7) 1 - Minimum 7 - Maximum
• Financial stability	5.57
• General attitude of staff	5.45
• Regular contact at appropriate level	5.33
• Overall standard of finished job	5.22
• Having an effective site agent	5.15
• BS 5750 Quality Assurance	4.73
• Directly employed labour	4.41

8.5.3.9 Recognition

The recognition activities, mainly included awards and personal thanks by top management. At site level, 'Site of the year' award was maintained annually, and the best site team selected for the award. Surveys were conducted among site level staff to identify how they would prefer to be recognised for their achievements, based on which, teams were usually paid for entertainments such as a football match, dinner at restaurant, and so on. This included, presentation of pens engraved with company's emblem to each member of the team. In addition, 'supplier of the year', and 'sub-contractor of the year' awards were also maintained to recognise best suppliers and sub-contractors. These awards included the company's emblem engraved into a metal shield presented to teams at dinners arranged in famous restaurants. The Contracts Manager, Site Manager, and other relevant staff attended the presentation dinner with the celebrities. These awards were maintained at regional levels by regional level management teams. Each region nominated several site teams (including the suppliers) to the Regional Management Team. The assessment panel comprised the Regional Director, Contracts Manager, Quality and Safety Engineer, and senior Quantity Surveyor, which analysed performance of the nominated teams and recommended the best team for the award.

8.5.4 A DFD model of empowerment implementation in Company-C

From the nine units of analysis, as described above, DFD models of empowerment implementation in company-C are discussed below under three major phases: preparation phase; implementation phase; and sustaining phase. Similar to companies A and B, company C, in the preparation phase, investigated several policies and strategies and produced plans for effectively implementing empowerment. In the implementation phase, employees were continuously trained to be able to act as an empowered workforce. After

acquiring sufficient skills through training, the sustaining phase deals with how empowered employees act independently in improving their business process. Figures 8.26 to 8.34 illustrate the DFD models of empowerment implementation in company-C.

8.5.4.1 Preparation phase

The key processes involved in this phase were: develop vision and policy; develop implementation plan; and resources development (see Figure 8.26). The Quality Management Team played a key role in producing appropriate vision, policies, plans, and developing subsequent resources for implementing empowerment. Employees were encouraged to participate in producing company policies and developing necessary resources for the implementation. The Managing Director led the Quality Management Team to effectively perform these tasks. The data description of the preparation phase of the implementation model of company-C is as follows.

DEVELOP VISION AND POLICY (*Entry type:* Process)

Specification: This process deals with the following data: new strategic directions and policies; vision and policy; and suggestions through workshops. The Managing Director was responsible for this process. The Quality Management Team assisted the Managing Director in developing company vision and policies. Workshops were conducted, where, the company's vision and policies were explained, and suggestions from employees were sought and used for improving them. The finalised vision and policies were supplied to external customers and suppliers for information.

NEW STRATEGIC DIRECTIONS AND POLICIES (*Entry type:* Data element)

VISION AND POLICY (*Entry type:* Data element)

SUGGESTIONS THROUGH WORKSHOPS (*Entry type:* Data element)

VISION STATEMENT (*Entry type:* Data store)

DEVELOP IMPLEMENTATION PLAN (*Entry type:* Process)

Specification: This process deals with the following data: implementation strategies and plans; and plan. Quality Management Team (QMT) was responsible for this task. The Managing Director assisted the QMT in developing the implementation plan.

IMPLEMENTATION STRATEGIES AND PLANS (*Entry type:* Data element)

PLANS (*Entry type:* Data element)

RESOURCES DEVELOPMENT (*Entry type:* Process)

Specification: This process deals with the following data: required resources; required major resources; required minor resources; cost benefit report; assistance/financial data; major resources; resources sanctioned; and minor resources (see Figure 8.27). Both the management and employees identified resources necessary for implementing empowerment. This was an ongoing process. Initially, the Quality Management Team (QMT) provided the major resources identified from the implementation plan. These included organisational restructuring, fund, and physical facilities. As an ongoing process, both the management and employees continuously identified the need for resources that they came across in their day-to-day involvement. Employees, reported the minor needs to the relevant department or Regional Management Team, and the major needs to the QMT. For major needs, cost benefit analysis was performed by employees with the assistance of regional level finance departments, and submitted to the QMT for approval. The QMT, in turn, assessed them with the assistance of group level finance departments, and provided funds to employees if they were feasible.

REQUIRED RESOURCES (*Entry type:* Data element)

REQUIRED MAJOR RESOURCES (*Entry type:* Data element)

REQUIRED MINOR RESOURCES (*Entry type:* Data element)

COST BENEFIT REPORT (*Entry type:* Data element)

ASSISTANCE/FINANCIAL DATA (*Entry type:* Data element)

MAJOR RESOURCES (*Entry type:* Resource element)

RESOURCES SANCTIONED (*Entry type:* Resource element)

MINOR RESOURCES (*Entry type:* Resource element)

8.5.4.2 Implementation phase

The DFD models of implementation phase can be seen in Figures 8.28 and 8.29. This phase deals with the following processes: training workshops; establish individual annual appraisal folders; training system; employee attitude survey; and grievance solving. All of these processes are not sequential. However, the implementation phase, first started with series of training workshops conducted by the QMT. During these workshops, awareness on empowerment, problem solving techniques and principles of empowerment were offered to employees. Before these workshops, the QMT and other senior members of the company were first trained on the above issues by external consultants. The other processes, including establishement of an individual annual appraisal folder, training system, employee attitude survey, and grievance solving were concurrent. After the training workshops, Regional Management Teams were empowered to decide on implementing empowerment within their regions. Once they were committed to empowerment, supervisors established 'Annual appraisal folders' for their subordinates, wherein, all of the personal details regarding skill improvements, failures and performance of subordinates were documented. This was used as a tool to establish areas of performance improvement for individuals. Based on both deficiencies of skills identified from the Annual appraisal folder and discussions between supervisors and individuals, training needs were identified, and reported to the Personnel department. This department was responsible for arranging continuous training to employees. Simultaneously, employees' attitude surveys were periodically conducted by the QMT to assess satisfaction levels, problems and grievances. Grievances as perceived by supervisors and the QMT

were solved once they were identified. The data description of the implementation model of company-C is as follows.

TRAINING WORKSHOPS (*Entry type:* Process)

Specification: This process deals with the data: awareness, problem solving, and so on; and initial training and training strategy. A series of topdown workshops were conducted by the QMT for various levels of the organisation. Prior to these workshops, QMT was trained by external consultants. The consultants were also used for advice in producing an appropriate training strategy for the company.

INITIAL TRAINING AND TRAINING STRATEGY (*Entry type:* Data element)

AWARENESS, PROBLEM SOLVING, ETC. (*Entry type:* Data element)

ESTABLISH INDIVIDUAL ANNUAL APPRAISAL FOLDER (*Entry type:* Process)

Specification: This process deals with the following data: personal details; personal details and problems; and the annual appraisal folder. Annual appraisal folders were established for each individual by their immediate supervisors. Employees' performance on their business were observed by their supervisors and recorded on the folder. This also included documentation of skill deficiencies, training needs, training effects, and certification details.

PERSONAL DETAILS (*Entry type:* Data element)

PERSONAL DETAILS AND PROBLEMS (*Entry type:* Data element)

ESTABLISHED ANNUAL APPRAISAL FOLDER (*Entry type:* Data element)

ANNUAL APPRAISAL FOLDER (*Entry type:* Data store)

TRAINING SYSTEM (*Entry type:* Process)

Specification: This process deals with the following data: training needs; identified trainers; trainers; training schedule; training topics; training schedule and topics; feedback; education and skills; specific training place; learned skills; training effects; training effect report; training certificate; certificate; and certification details (see Figure 8.29).

Supervisors and employees jointly identified skill deficiencies and needs for training. Identified training needs were conveyed to the Personnel department, which in turn prepared training topics and identified trainers, and sent the details to the Training Co-ordinator. The Training Co-ordinator prepared schedules and arranged the venue for the training. All of these details were informed to respective individuals and trainers. After training, supervisors observed the progress of employees in effectively applying learned knowledge to the business, and documented such in the Annual appraisal folder. Successful performers, who were perceived as having acquired sufficient skills to perform their jobs independently with less or no supervision, were certified by the Personnel department.

TRAINING NEEDS (*Entry type:* Data element)

IDENTIFIED TRAINERS (*Entry type:* Data element)

TRAINERS (*Entry type:* Resource element)

TRAINING SCHEDULE (*Entry type:* Data element)

TRAINING TOPICS (*Entry type:* Data element)

TRAINING SCHEDULE AND TOPICS (*Entry type:* Data element)

EDUCATION AND SKILLS (*Entry type:* Data element)

SPECIFIC TRAINING PLACE (*Entry type:* Data element)

LEARNED SKILLS (*Entry type:* Data element)

TRAINING EFFECTS (*Entry type:* Data element)

FEEDBACK (*Entry type:* Data element)

TRAINING EFFECT REPORT (*Entry type:* Data element)

TRAINING CERTIFICATE (*Entry type:* Data element)

CERTIFICATION DETAILS (*Entry type:* Data element)

EMPLOYEE ATTITUDE SURVEY (*Entry type:* Process)

Specification: This process deals with the following data: questionnaire survey; satisfaction, problems, grievances; results; and training needs if any. The Quality

Management Team was responsible for this process. Employees attitudes, satisfaction, and grievances were continuously tracked through periodic questionnaire surveys, and the results (Employee survey report) were published to employees. This survey also identified overall training needs for employees.

QUESTIONNAIRE SURVEY (*Entry type:* Data element)

SATISFACTION, PROBLEMS, GRIEVANCES (*Entry type:* Data element)

RESULTS (*Entry type:* Data element)

TRAINING NEEDS IF ANY (*Entry type:* Data element)

EMPLOYEE SURVEY REPORT (*Entry type:* Data store)

GRIEVANCES SOLVING (*Entry type:* Process)

Specification: This process deals with the following data: grievances; major grievances; solved minor grievances; solved major grievances; and grievances solved. Grievances identified from both the employee attitude survey and employees were analysed and solved by supervisors (if they were minor). The major ones were forwarded to the Quality Management Team, which in turn analysed and solved them.

GRIEVANCES (*Entry type:* Data element)

SOLVED MINOR GRIEVANCES (*Entry type:* Data/Resource element)

MAJOR GRIEVANCES (*Entry type:* Data element)

SOLVED MAJOR GRIEVANCES (*Entry type:* Data/Resource element)

GRIEVANCES SOLVED (*Entry type:* Data/Resource element)

8.5.4.3 Sustaining phase

The sustaining phase deals with the following key processes: periodic survey/meetings; process improvements by departments; process improvements by employees/teams; group level performance measurements; and recognise achievements (see Figures 8.30 to 8.34).

The data descriptions of models of the sustaining phase of empowerment implementation in company-C is as follows.

PERIODIC SURVEY/MEETINGS (*Entry type:* Process)

Specification: This process deals with the following data: list of customers and suppliers; expectations/problems; survey results; and company wide problems/survey results. Both customers and suppliers were involved through periodic surveys or meetings, where, their requirements and perceptions on the service provided by the company were shared. Results of these survey results were documented as reports and published to employees. The Regional Management Team was responsible for this task. Lists of customers/suppliers were maintained and updated at regional level, from which all customers and suppliers were regularly contacted. Company level problems, as perceived from these contacts, were reported to the Quality Management Team.

LIST OF CUSTOMERS/SUPPLIERS (*Entry type:* Data element)

EXPECTATIONS/PROBLEMS (*Entry type:* Data element)

SURVEY RESULTS (*Entry type:* Data element)

COMPANY WIDE PROBLEMS/SURVEY RESULTS (*Entry type:* Data element)

EXTERNAL SURVEY/MEETINGS REPORTS (*Entry type:* Data store)

PROCESS IMPROVEMENTS BY DEPARTMENTS (*Entry type:* Process)

Specification: This process deals with the following data: company wide problems; department level problems; department improvement plans; plan for approval; implementation/assistance; and results (see Figure 8.31). Problems, both within departments and company (company level problems identified from contacts with external customers and suppliers), were identified for improvement within departments. Based on these problems, plans for improvements were prepared by departments and submitted to the Quality Management Team for approval. After the approval, they were implemented

throughout the department with the assistance of employees. The results were reported back to the Quality Management Team.

DEPARTMENT LEVEL PROBLEMS (*Entry type:* Data element)

DEPARTMENT IMPROVEMENT PLANS (*Entry type:* Data element)

PLAN FOR APPROVAL (*Entry type:* Data element)

IMPLEMENTATION/ASSISTANCE (*Entry type:* Data/Resource element)

RESULTS (*Entry type:* Data element)

PROCESS IMPROVEMENTS BY EMPLOYEES/TEAMS (*Entry type:* Process)

This process deals with the following data: company wide problems; assistance; job specific problems; problems; plan/options; plan; plan/analysis report; cost benefit analysis for approval; implementation plan; fund if any; individual performance appraisal; and performance appraisal (see Figure 8.32). Employees or teams identified problems for improvement through several sources, including problems that emerged from their day-to-day business activities and problems that were observed by the Regional Management Team from external (customers and suppliers) contacts. Following identification of problems, respective employees or teams produce proposals and their cost benefits and submit them to the Regional Management Team for approval. The approved proposals were implemented and performance results were measured and documented in the Annual appraisal folder. In all of these improvement processes, supervisors or team members assisted respective employees or teams in solving problems.

COMPANY WIDE PROBLEMS (*Entry type:* Data element)

JOB SPECIFIC PROBLEMS (*Entry type:* Data element)

ASSISTANCE (*Entry type:* Data/Resource element)

PLAN/OPTIONS (*Entry type:* Data element)

PROBLEMS (*Entry type:* Data element)

PLAN (*Entry type:* Data element)

PLAN/ANALYSIS REPORT (*Entry type:* Data element)

COST BENEFIT ANALYSIS FOR APPROVAL (*Entry type:* Data element)

IMPLEMENTATION PLAN (*Entry type:* Data element)

FUND IF ANY (*Entry type:* Data element)

IMPLEMENTATION HISTORY (*Entry type:* Data element)

INDIVIDUAL PERFORMANCE APPRAISAL (*Entry type:* Data element)

PERFORMANCE APPRAISAL (*Entry type:* Data element)

GROUP LEVEL PERFORMANCE MEASUREMENTS (*Entry type:* Process)

Specification: This process deals with the following data: individual performance appraisal; employee attitude, satisfaction; financial data; performance data; data; performance report; results; assistance; and publications (see Figure 8.33). The Quality Management Team (QMT) was responsible for this. Data was gathered from several sources including, employees' performance from annual appraisal folders, employee survey reports, and financial data obtained from finance departments. These data were analysed by the QMT with the assistance of the finance department, and the results published to both employees and external customers and suppliers.

INDIVIDUAL PERFORMANCE APPRAISAL (*Entry type:* Data element)

EMPLOYEE ATTITUDE, SATISFACTION (*Entry type:* Data element)

FINANCIAL DATA (*Entry type:* Data element)

PERFORMANCE DATA (*Entry type:* Data element)

DATA (*Entry type:* Data element)

PERFORMANCE REPORT (*Entry type:* Data element)

ASSISTANCE (*Entry type:* Data/Resource element)

RESULTS (*Entry type:* Data element)

PUBLICATIONS (*Entry type:* Data element)

RECOGNISE ACHIEVEMENTS (*Entry type:* Process)

Specification: This process deals with the following data: nominations; selected accomplishers; award details; nomination for award; participation in ceremony dinner; and

awards/thanks (see Figure 8.34). Supervisors, team members or team leaders, after recognising accomplishments of individuals nominate respective individuals for award. The Regional Management Team assess those nominations and select the best accomplishers for award. The details of the award including the venue and participants were informed to relevant staff. The award dinner was conducted, where the accomplishers were thanked and awarded their gifts.

NOMINATIONS (*Entry type:* Data element)

SELECTED ACCOMPLISHERS (*Entry type:* Data element)

AWARD DETAILS (*Entry type:* Data element)

NOMINATION FOR AWARD (*Entry type:* Data element)

PARTICIPATION IN CEREMONY DINNER (*Entry type:* Resource element)

AWARDS/THANKS (*Entry type:* Data/Resource element)

Figure 8.26. Level 1 DFD - Preparation phase (Company C)

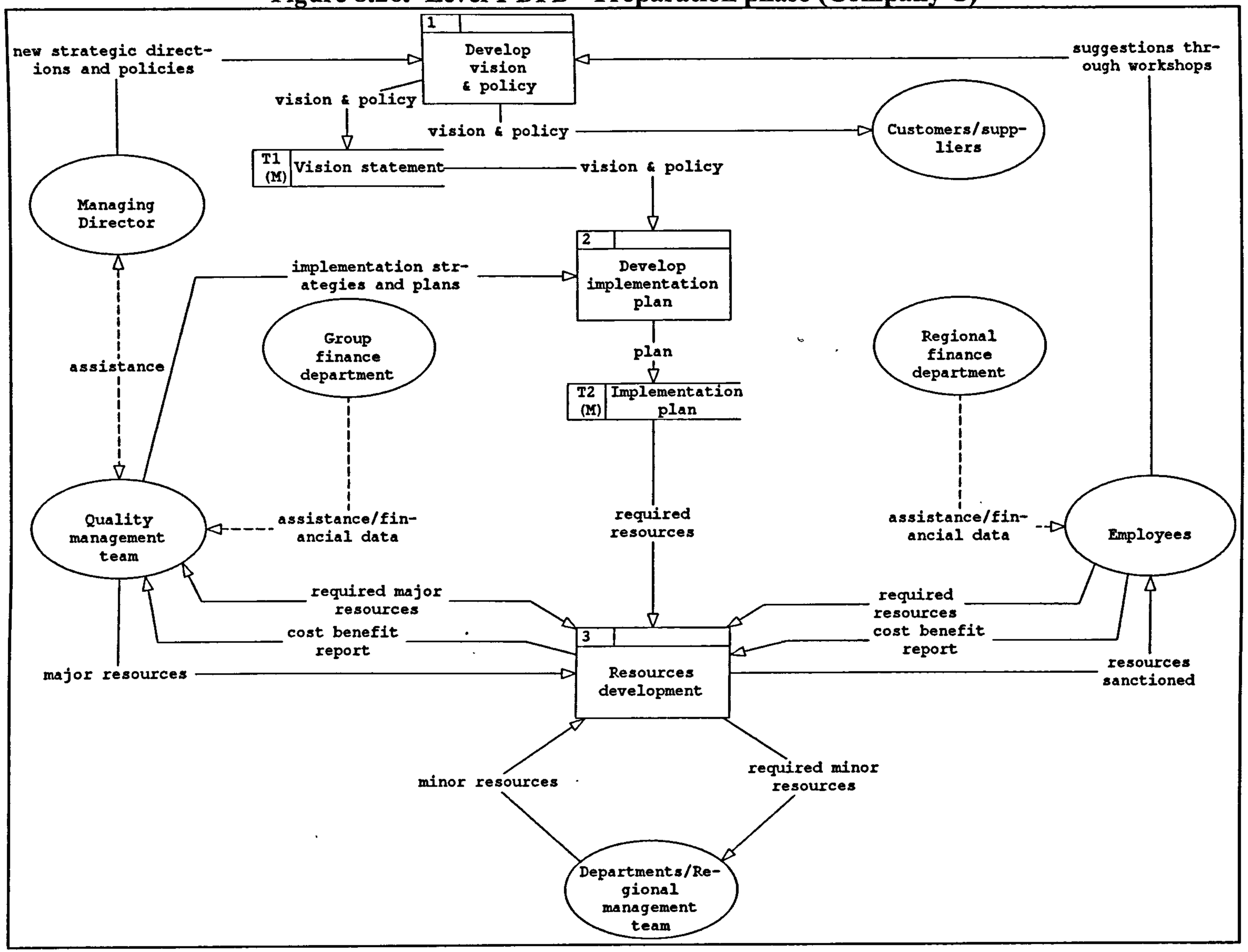


Figure 8.27. Level 2 DFD: Preparation phase - Resources development (Company C)

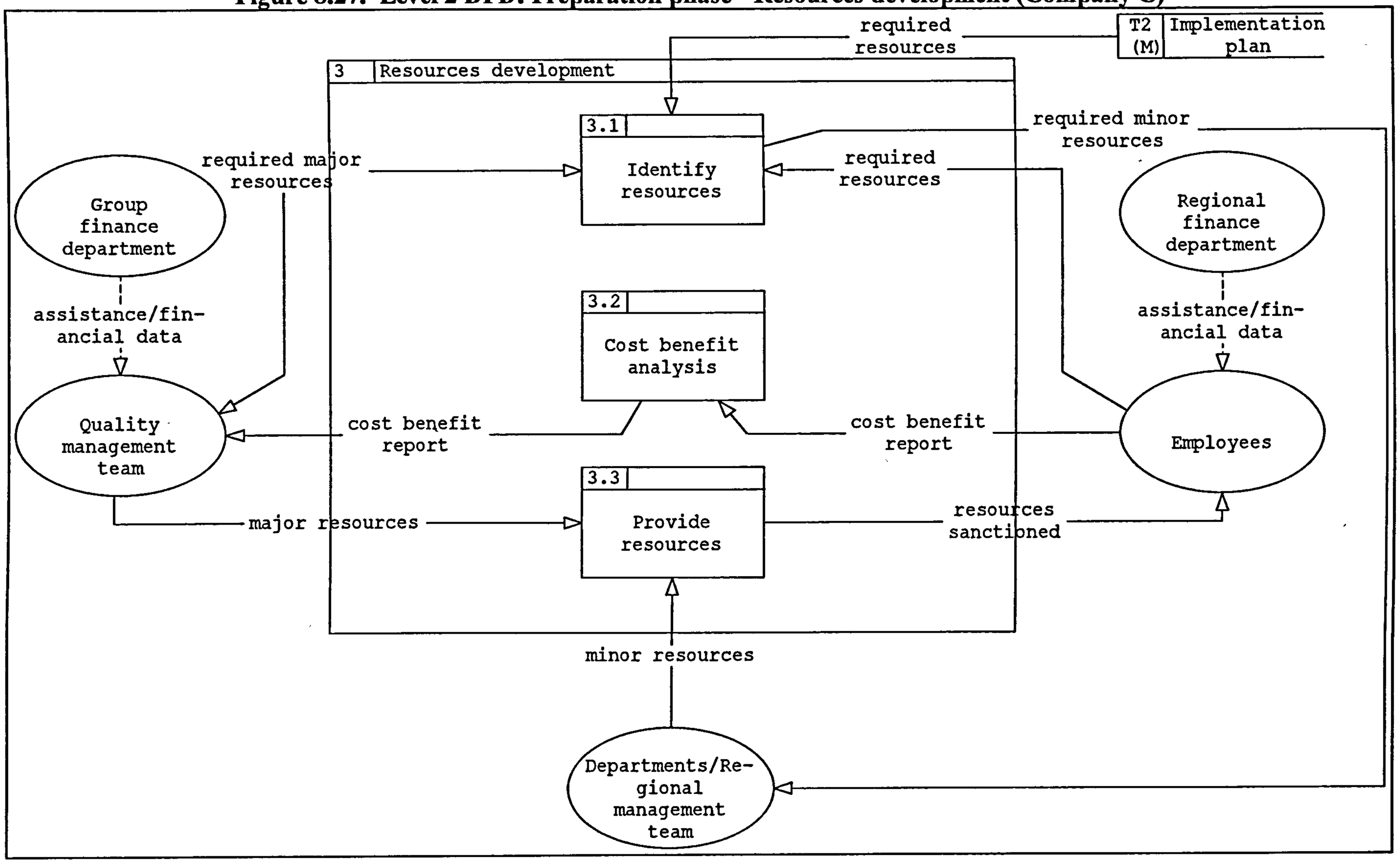


Figure 8.28. Level 1 DFD - Implementation phase (Company C)

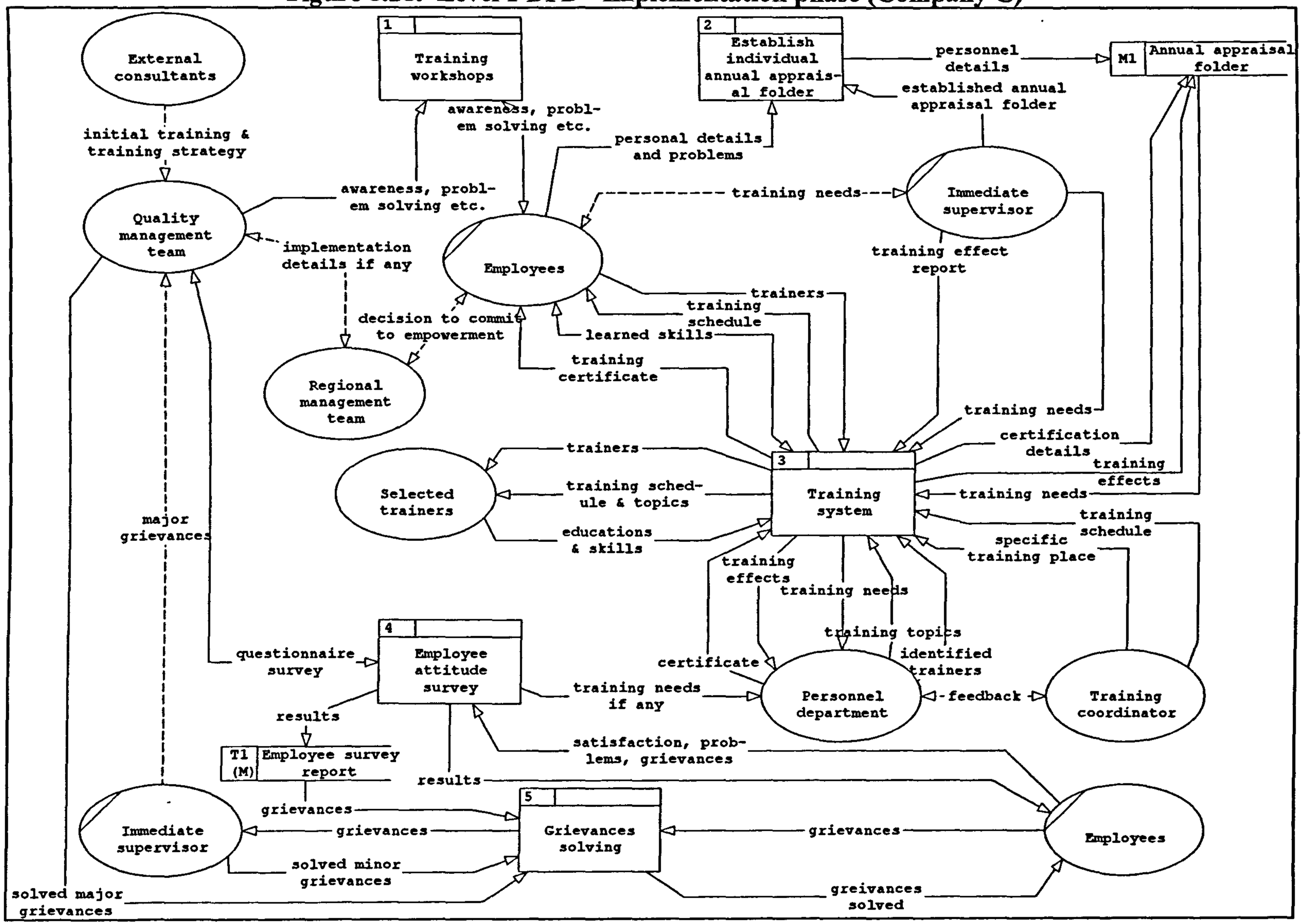


Figure 8.29. Level 2 DFD - Implementation phase - Training system (Company C)

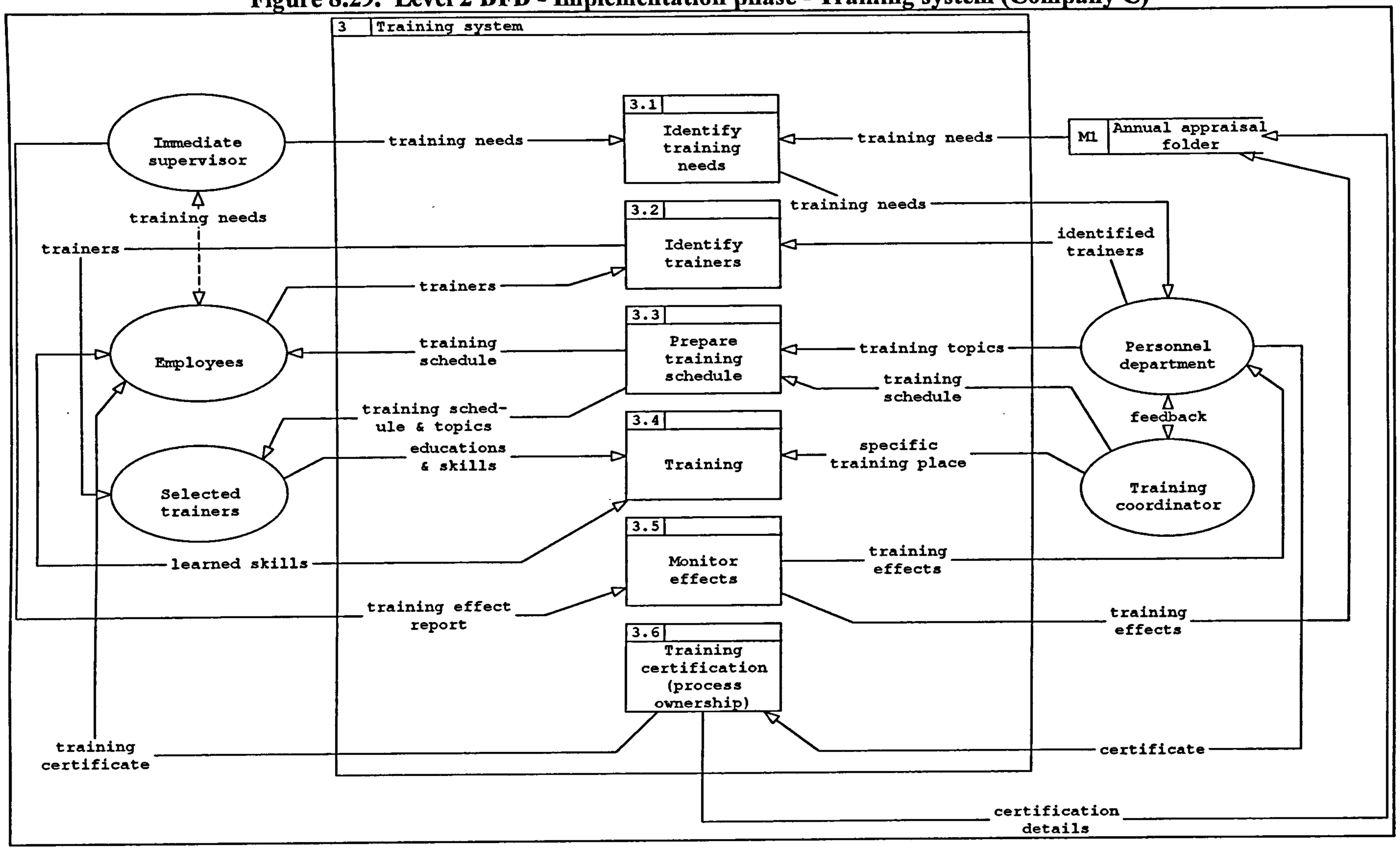


Figure 8.30. Level 1 DFD - Sustaining phase (Company C)

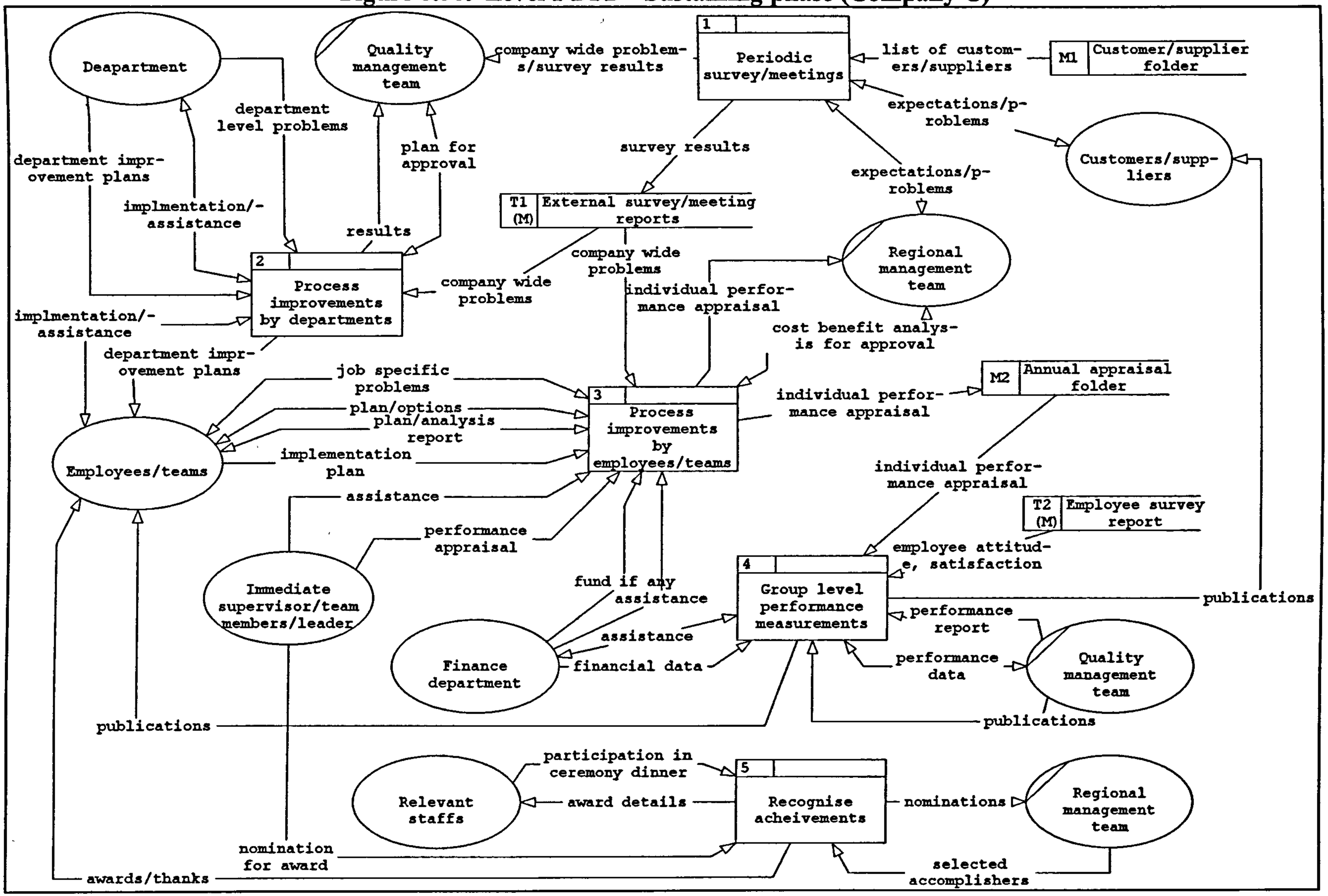


Figure 8.31. Level 2 DFD - Sustaining phase - Process improvements by departments (Company C)

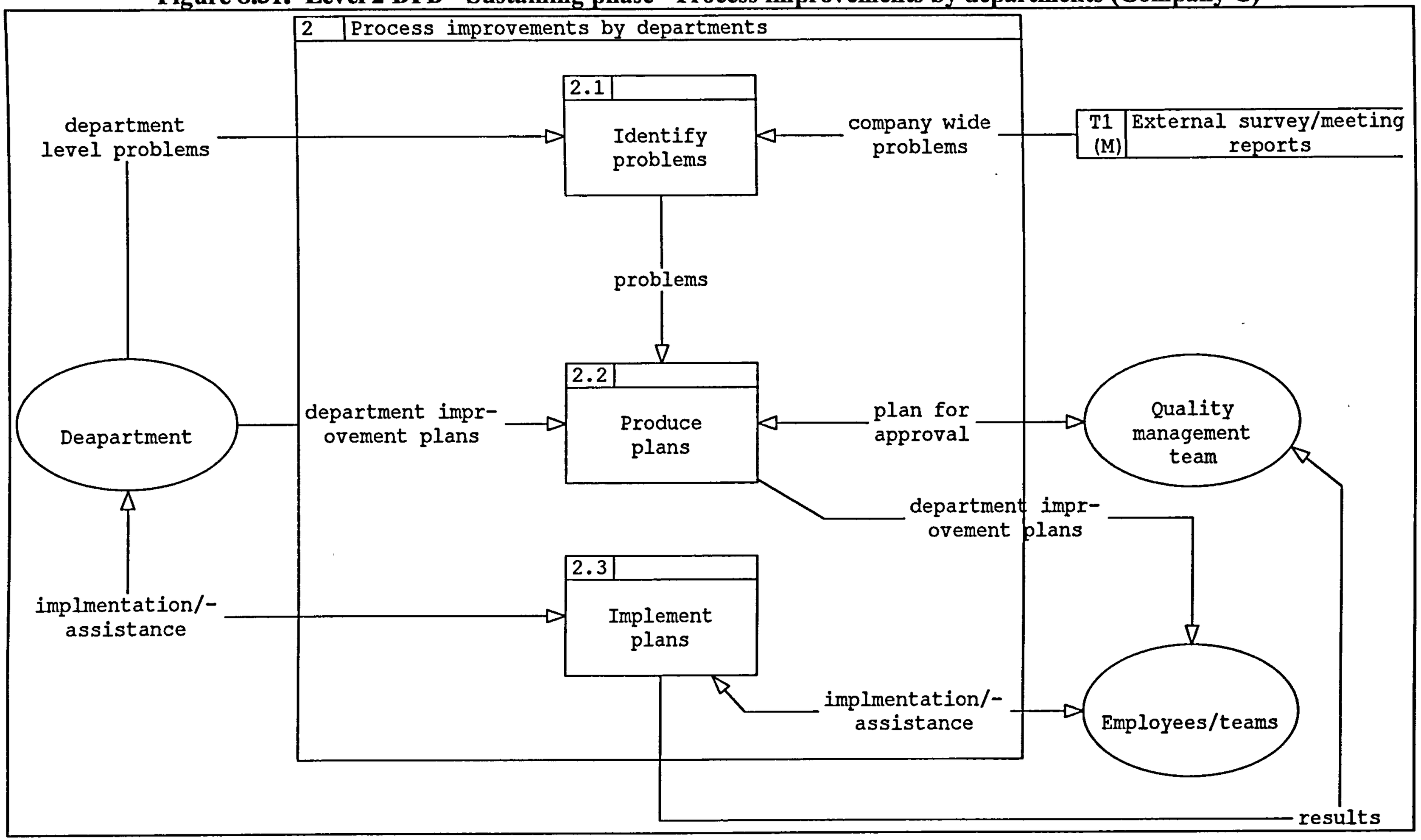


Figure 8.32. Level 2 DFD - Sustaining phase - Process improvements by employees/teams (Company C)

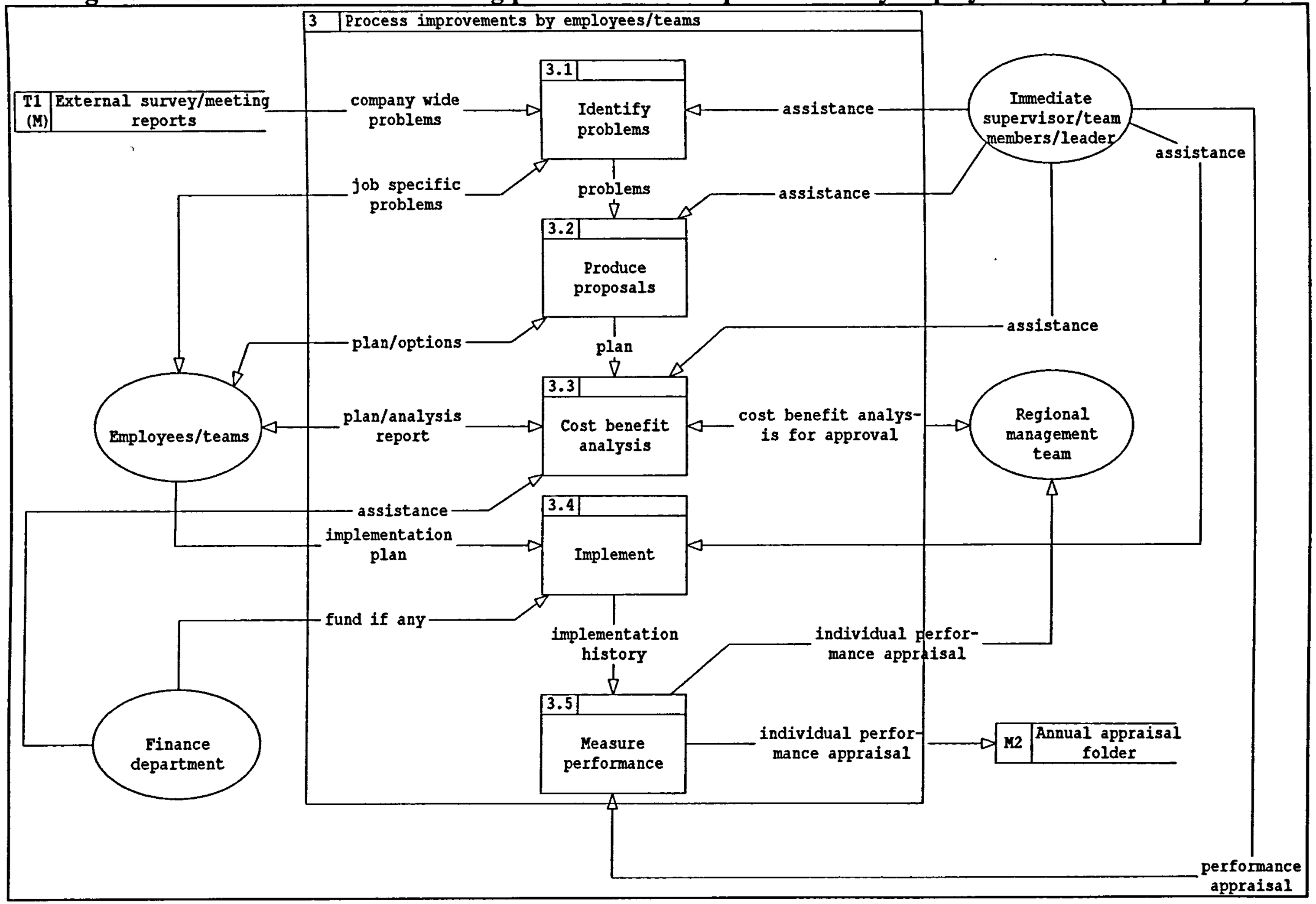


Figure 8.33. Level 2 DFD - Sustaining phase - Group level performance measurements (Company C)

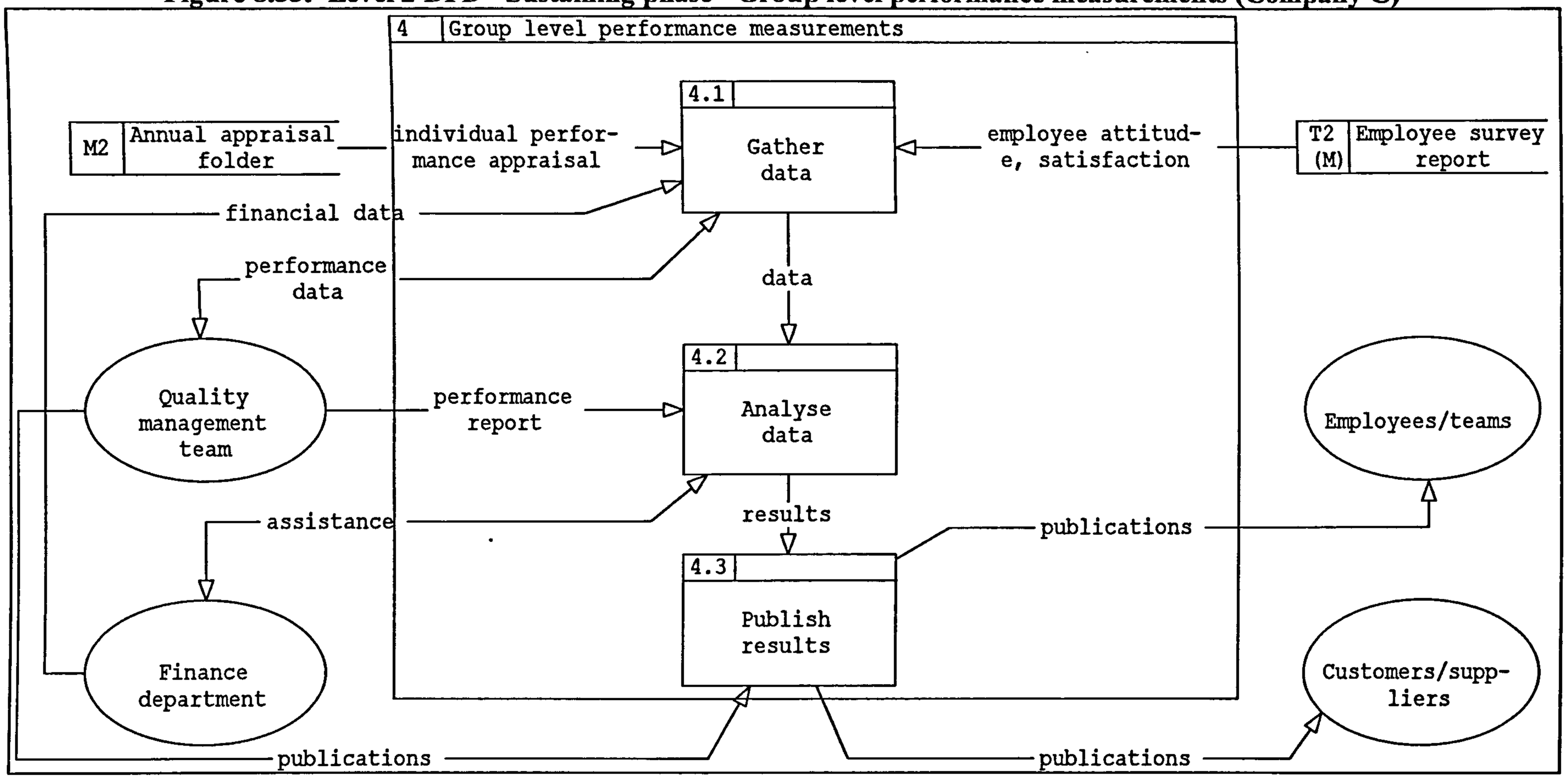
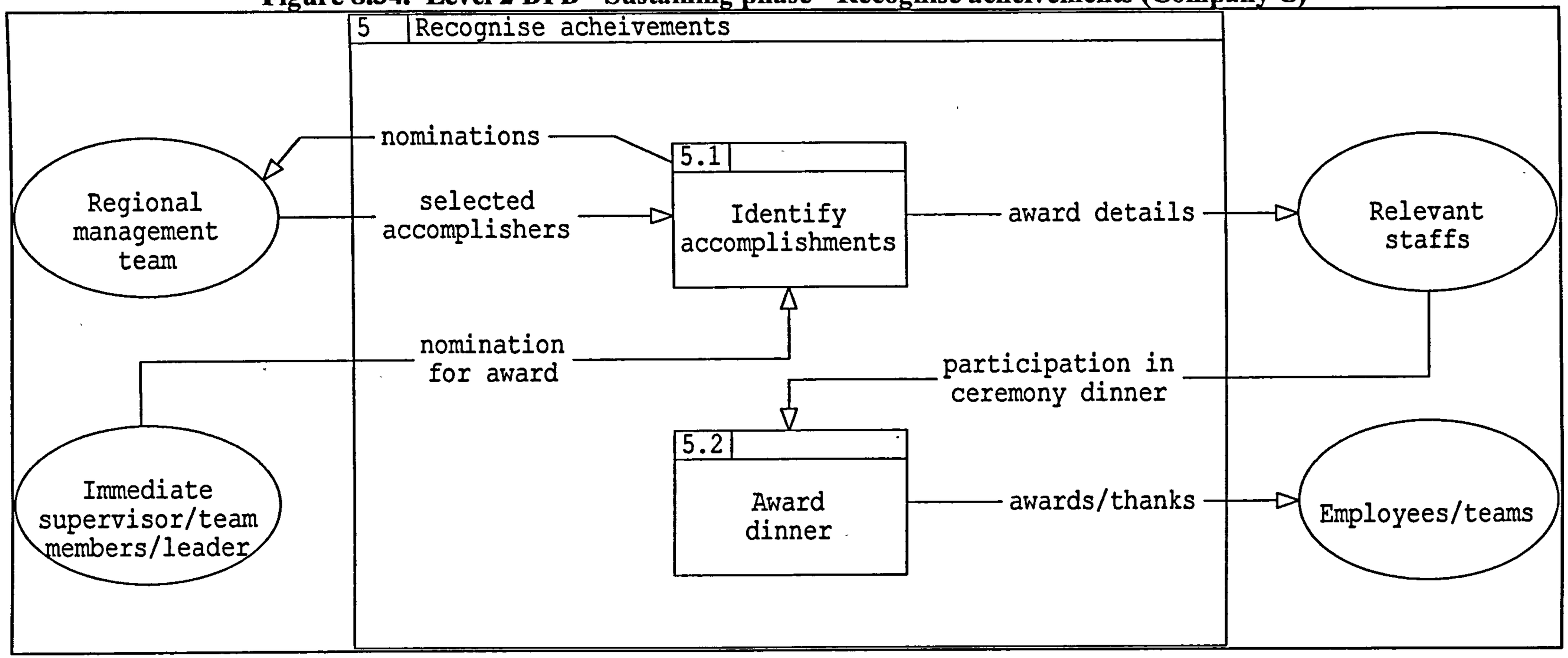


Figure 8.34. Level 2 DFD - Sustaining phase - Recognise acheivements (Company C)



8.6 Discussion of DFDs of companies A, B and C leading to a generic model

Based up on DFD models of the three companies, a matrix showing the empowerment processes that the companies adopted and respective involvement of employees in performing those processes are briefly stated in Table 8.5. The table shows that most of the processes exhibit commonality across all of the three companies. There were little variation in the area of 'employees' self-management' between company A and C combined and B. On the other hand, other processes bear similar patterns of implementation (in respect of both procedures and employee involvement) across all of the three companies. However, it should be noted that some of the processes have been used under different constructs. For instance, 'Induction workshops' conducted at the implementation phase of company B were termed 'Information sessions' in company A and 'Training workshops' in company C. Establishment of 'Personnel development folder' in company A has been defined an 'Individual annual appraisal folder'.

Another important constraint is the question of 'timescale' over which each of the three phases (i.e. preparation phase, implementation phase, and sustaining phase) can be implemented. The (case) companies have undergone each phase exhibiting varying degrees of timescale, hence, the exact time required for implementing each phase cannot be precisely prescribed. This variance may be because of the varying nature of organisations' own features and inherent capabilities in efficiently undertaking the implementation process. Regardless of time, satisfying the requirement for efficient implementation should be the overriding concern.

The following compares and contrasts the implementation approaches adopted by companies A, B and C, and identifies appropriate processes for the development of a generic model in the implementation of empowerment.

Table 8.5. Matrix showing empowerment processes and employee involvement in companies A, B and C

Process	Involvement and procedures		
	Company A	**Company B**	**Company C**
Develop vision	• Produced by the Group Steering Committee (GSC) • Divisional Boards assisted the GSC • Employees suggested ideas for improvements through consultation	• Produced by the Dream Team (DT) • Empoyees and departments suggested ideas for improvements	• Produced by the Managing Director • The Quality Management Team (QMT) assisted the MD • Employees suggested ideas for improvements through workshops
Develop policy	• GSC prepared policy • Divisional boards assisted GSC • Employees suggested ideas for improvements	• DT prepared policy • Employees suggested for improvements	• Both MD and QMT produced policy • Employees suggested ideas for improvements
Diagnose organisational capabilities	• Diagnosed by GSC • Questionnaire survey with employees	Not used in company B	Not used in company C
Develop implementation plan	• Developed by GSC • Divisional boards assisted and provided data	• DT produced plans • Regional Management Team (RMT) involved	• Regional Management Team (RMT) produced plan • QMT assisted RMT
Develop resources	• All departments, teams and individuals identified resources • Minor resources provided by the RMT • Major resources provided by the GSC	• All departments, teams and individuals identified resources • Minor resources provided by the RMT • Major resources provided by the DT • For major resources, the DT established Resources Development Committee	• All departments, teams and individuals identified resources • Minor resources provided by the RMT • Major resources provided by the GSC • Cost benefit analysis was performed for proposed resources • Finance departments assisted in cost benefit analysis

Induction workshops	• Called as Information sessions • External consultants trained the GSC • GSC trained the RMT and selected managers from regions	• Conducted by the DT • All employees were offered initial training	• Called as Training workshops • The QMT was first trained by external consultants • The QMT offered initial training to all employees
Establish personnel development folder	• Established and maintained by supervisors	Not used in company B	• Established and maintained by supervisors • The folder is called Individual Annual Appraisal Folder
Continuous training	• Training needs identified by both individuals and supervisors • Training schedule prepared by Training Department • Training arranged by Training Department • Effects monitored by supervisors • Training Dept. issued skill certificates	• Training needs identified by both individuals and supervisors • Training topics and schedules prepared by Training Dept. • Training offered by Training Dept. • Training Dept authorised Process Owners • Individuals themselves monitored effects	• Training needs identified by both individuals and supervisors • Personnel Dept. identified Trainers • Training place and dates arranged by the Training Co-ordinator • Effects monitored by supervisors • Personnel Dept. certified employees
Employee attitude survey	• Called as Quarterly Staff Attitude Survey • Questionnaire survey • Conducted by Quality College Manager of GSC	• Questionnaire survey • Conducted by RMT	• Questionnaire survey • Conducted by QMT
Grievances solving	• Informal • Also perceived from Quarterly Staff Attitude Survey	• Informal • Also perceived from Employee Attitude Survey	• Minor grievances solved by supervisor • Major grievances by senior management
Periodic survey/meetings (external)	• Questionnaire surveys with external customers and suppliers by both GSC and RMT • Mode of other contacts include: meetings, conferences, seminars	• Questionnaire surveys with external customers and suppliers by RMT • Other modes of contact include meetings	• Questionnaire surveys with external customers and suppliers by both QMT and RMT • Other modes of contact include meetings and conferences

Process improvements by senior management/department	• Company level problems identified by GSC and RMT • Task Teams formed by GSC to investigate problems • Implementation plans produced by Task Teams • RMT identified suitable individual/teams • Plans implemented by individuals and/or teams	• Company level problems identified by the RMT • Departments/sections produced improvement plans • Improvement plans supplied to individuals for implementation	• Company level problems identified by QMT and RMT • Department level problems identified by departments along with company level problems • Departments produced department level improvement plans • Individuals and/or departments implemented plans
Process improvement by employees/teams	• Employees/teams identified relevant process level problems • Developed improvement plans • Produced cost benefit analysis for improvement plans • Sought approval from RMT • Supervisors assisted in all of the above processes • Performance measured by both employees and supervisors	• Employees identified Partners • Produced self-development vision • Identified skill deficiencies • Sought training from Training Department • Identified problems for improvement • Produced and implemented plans for improvement • Conducted 360 degrees appraisal survey for performance • Partners assisted and advised in all of the above processes	• Employees/teams identified relevant process level problems • Produced improvement proposals • Produced cost benefit analysis for proposals • Finance depts. assisted in cost benefit analysis • Sought approval from RMT • Implemented proposals • Supervisors/team members/leaders measured performance
Company level performance measurements	• GSC gathered data from Annual survey report, Personnel Development folder, and finance department • Analysed performance • Identified competitors • Benchmarked performance with competitors • Published results	• Benchmarking Team (BT) established from DT • BT collected data from RMTs and finance departments • Analysed company level performance • Identified competitors • Benchmarked performance with competitors	• The QMT collected data from Annual appraisal folders, Employee survey report, and finance department • Analysed company level performance • Published results

Recognise achievements	• Performance achievements identified by supervisors and leaders • GSC or RMT selected highest accomplishments • Conducted meeting and presented award • Senior management staff presented award	• Performance achievements reported to the RMT • RMT selected accomplishments • Conducted meeting and presented awards	• Accomplishments nominated to RMT by supervisors/teams/leaders • RMT selected accomplishments • Arranged dinner and presented awards • Site of the year award to company site teams • Supplier of the year award to external suppliers • Sub-contractor of the year award to sub-contractors.

8.6.1 Preparation phase

In the preparation phase, all companies performed the following processes: develop vision; develop policy; develop implementation plan; and develop resources. The only variation was 'diagnosing organisational capabilities' to assess organisational readiness for implementing empowerment, which was performed only by company A.

The senior management, i.e. companies' Main Boards (Group Steering Committee in company A, Dream Team in Company B, and Quality Management Team in Company C) played a crucial role in the earlier stages of implementation. This included development of company vision, policies, implementation plans, and necessary resources for the implementation of empowerment. In all of the companies, regional level management participated in these processes and assisted Main Boards by providing necessary data and suggestions for improvement. Similarly, employees were encouraged to make suggestions and ideas for improvements. This was achieved by several means. For instance, company A involved selected employees from various levels of the organisation in the development

of vision and policy, where as, company C conducted workshops to seek suggestions from employees. This indicates that employees were encouraged to participate in decision making at higher levels of the organisation.

Resources development was considered as one of the crucial processes by all three companies. A similar procedure of the resources development process occurred across the companies. Employees reported their resource requirements to either the regional management or immediate supervisors. Minor resources were analysed and provided by the regional level management, and major resources were sanctioned by the Main Board. There was a little variation in that, company B established a Resource Development Committee for assessing major resources, where as, in companies A and C, the Main Board itself undertook this task. Unlike companies A and B, company C insisted that all proposals seeking resources must be accompanied by a cost benefit analysis. Finance departments assisted employees in cost benefit analysis. This exercise (cost benefit analysis) may enable employees to better understand the cost implications of their needs, however, it may be an over burden for employees at lower levels. As in companies A and B, if this analysis (resources assessment including cost benefit analysis) is performed by respective senior and middle management (with the assistance of the finance department), then it would free employees to concentrate on improvement of their own business processes.

As already stated, the major difference in the preparation phase was diagnosing organisational capabilities (i.e. fund, organisational structure, employees attitudes) for implementing empowerment. This was performed only by company A. Although it is very important to assess the organisation's readiness to implement empowerment, companies B and C did not perform this exercise at the beginning of the preparation phase.

Best practices for the preparation phase

From the above discussion, five distinct participants (entities) were identified, they are: the senior management (company Main Board and other senior staff); external consultants; employees/Teams; middle management (Regional Management Team and other regional level senior managers); and finance departments (both company level and regional level). Based on the above discussion and involvement of key participants, the following key best practices are identified for the improvement of the preparation phase.

- Senior management develops company level vision and policies and seeks suggestions/comments from employees over them.
- Middle management becomes involved in the development of vision and policies, and is encouraged to develop middle level visions for improvements.
- Depending on the in-house expertise, external consultants may be appointed for advice in the development of company policies.
- Senior management diagnoses organisational capabilities (including organisational structure, employees attitudes and skills) for implementing empowerment.
- Based on the assessment of organisational capability, vision and policy, senior management produces an implementation strategy and plan (including procedures and roles) with the assistance of middle management.
- All levels of the organisation, including senior management, middle management, and employees identify resources. The respective middle management along with senior management evaluate the benefits of those resources (with the assistance of the finance department) and provide them to employees.

Generic model of the preparation phase

Having identified the key best practices for improvement of the preparation phase, the processes and respective data flows (of the preparation phase) of all of the three

companies were analysed within the context of the best practices, and a Generic DFD (GDFD) model for the preparation phase was developed (see Figure 8.35 and 8.36). Since the designation of the entities of the case companies varied from one company to another, they were renamed to make them more generic and applicable to a wider range of companies. For instance, the Group Steering Committee of company A, the Dream Team of Company B, and the Quality Management Team of company C all represent the senior management of a company. Hence, these teams were generically represented in the model as Company Board (Senior Management). This also includes some of the other senior management staff like Finance Director, Quality College Manager (company A), and the Chief Engineer (company C). The Regional Management Team is named Middle Management. Similar entities perceived across the three companies such as finance departments, personnel departments, employees/teams, and external consultants were left unaltered. The data description of the generic model of the preparation phase is described below.

DEVELOP VISION (*Entry type*: Process)

Specification: This process deals with the following data: new strategic directions and ideas; middle level vision/suggestions; suggestions/comments; and vision. The Company Board (senior management) is responsible for developing vision. The Middle Management become involved in developing company level vision and also produces middle level (regional level) vision in line with the company level vision. Employees' input, in the form of suggestions and comments are sought to both improve and assess the feasibility of the vision.

NEW STRATEGIC DIRECTIONS & IDEAS (*Entry type*: Data element)

MIDDLE LEVEL VISION/SUGGESTIONS (*Entry type*: Data/Resource element)

SUGGESTIONS/COMMENTS (*Entry type*: Data element)

VISION (*Entry type*: Data element)

DEVELOP POLICY (QUALITY POLICY, EMPLOYEE POLICY) (*Entry type*: Process)

Specification: This process deals with the following data: company level policies; middle level problems and policies; vision; suggestions/comments; and policy. The Company Board develops the company level policy for achieving the vision. The policy included both the quality and employee related issues. The middle level problems and associated policies are shared between the Company Board and the Middle Management to produce a common policy that is applicable to all levels of the company. External consultants may be appointed for advice in producing a suitable policy for the company.

COMPANY LEVEL POLICIES (*Entry type*: Data element)

MIDDLE LEVEL PROBLEMS & POLICIES (*Entry type*: Data element)

POLICY (*Entry type*: Data element)

DIAGNOSE ORGANISATIONAL CAPABILITIES (*Entry type*: Process)

Specification: This process deals with the following data: policy; questionnaire/data; preparedness, attitudes and satisfaction; data/personnel for assistance; and results. The Company Board (senior management) conducts questionnaire survey amongst employees regarding company's policies and commitment to empowerment. Employees' attitudes and preparedness for the implementation of empowerment are assessed. The Middle Management provides necessary data and offers assistance to the Company Board in evaluating various aspects of the organisation including the organisational structure and funds for implementing empowerment.

QUESTIONNAIRE/DATA (*Entry type*: Data element)

PREPAREDNESS, ATTITUDES & SATISFACTION (*Entry type*: Data element)

DATA/PERSONNEL FOR ASSISTANCE (*Entry type*: Data/Resource element)

DEVELOP IMPLEMENTATION PLAN (*Entry type*: Process)

Specification: This process deals with the following data: implementation strategies and plans; results; data/personnel for assistance; and required resources. The Company Board

identified appropriate strategies and produced plans for the implementation process. Results of the organisational diagnosis and data from Middle Management are used to produce an effective plan. This includes physical involvement of the middle level managers in producing the implementation plan. The implementation plan also identifies the necessary resources required for implementation.

IMPLEMENTATION STRATEGIES & PLANS (*Entry type*: Data element)

DATA/PERSONNEL FOR ASSISTANCE (*Entry type*: Data/Resource element)

RESULTS (*Entry type*: Data element)

REQUIRED RESOURCES (*Entry type*: Data element)

DEVELOP RESOURCES (*Entry type*: Process)

Specification: This process deals with the following data: required resources; required major resources; resources; data and estimate of resources; cost benefit report/feedback (see Figure 8.36). Resources required for the implementation process are identified at all levels of the organisation.. The minor resources are assessed and solved at the middle level, and the major resources are assessed and solved by the Company Board. The Finance Department assist both the Senior Management and Middle Management to assess the resources for cost benefits.

REQUIRED MAJOR RESOURCES (*Entry type*: Data element)

RESOURCES (*Entry type*: Data/Resource element)

DATA & ESTIMATE OF RESOURCES (*Entry type*: Data element)

COST BENEFIT REPORT/FEEDBACK (*Entry type*: Data element)

The generic Flow Chart model of the preparation phase

To complement the GDFD model, a flow chart model was developed to: express the GDFD in a simplistic form; and show the control mechanism of the system which the DFD fails to address (see section 7.3, Chapter 7 for more detail). Figure 8.37 illustrates the flow chart model. It can be seen that the flow chart is divided into columns with the name

of each department, function or personnel written at the top. The horizontal placement of an element indicates who, according to the labels across the responsibility bar at the top of the chart. Participant or helper of a particular event (process) is represented by a circle. A process is represented by a rectangular box, and for multiple processes by multiple boxes. At the point where decision has to be taken, a diamond shaped box bears the command. It can be seen from the figure that most of the processes are controlled by senior management (Company Board), assisted or co-operated by the middle management. It can also be seen that employees across the organisation participate in those processes.

Figure 8.35. Generic model - Level 1 DFD - Preparation phase

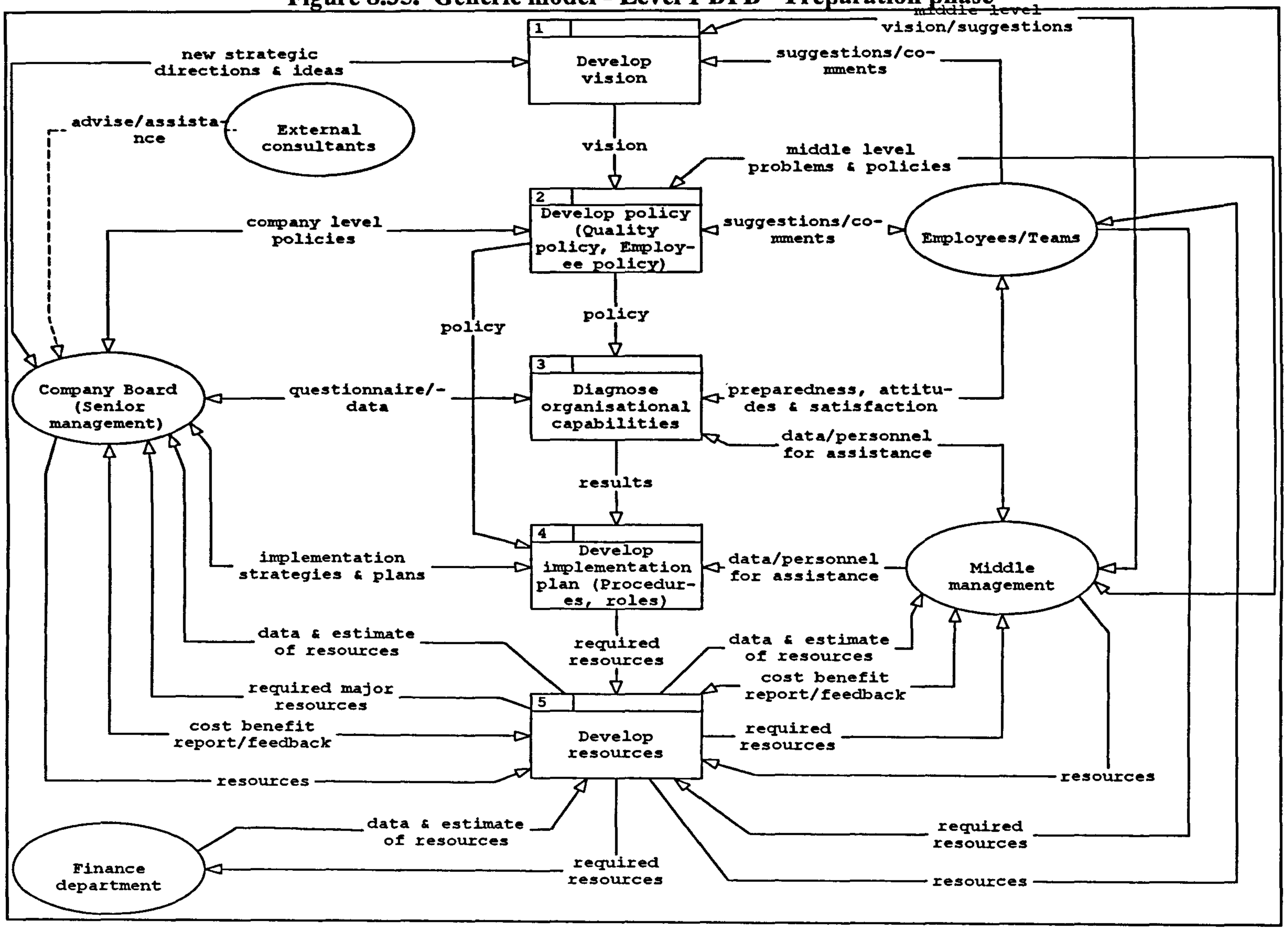


Figure 8.36. Generic model - Level 2 DFD - Resources development (Preparation phase)

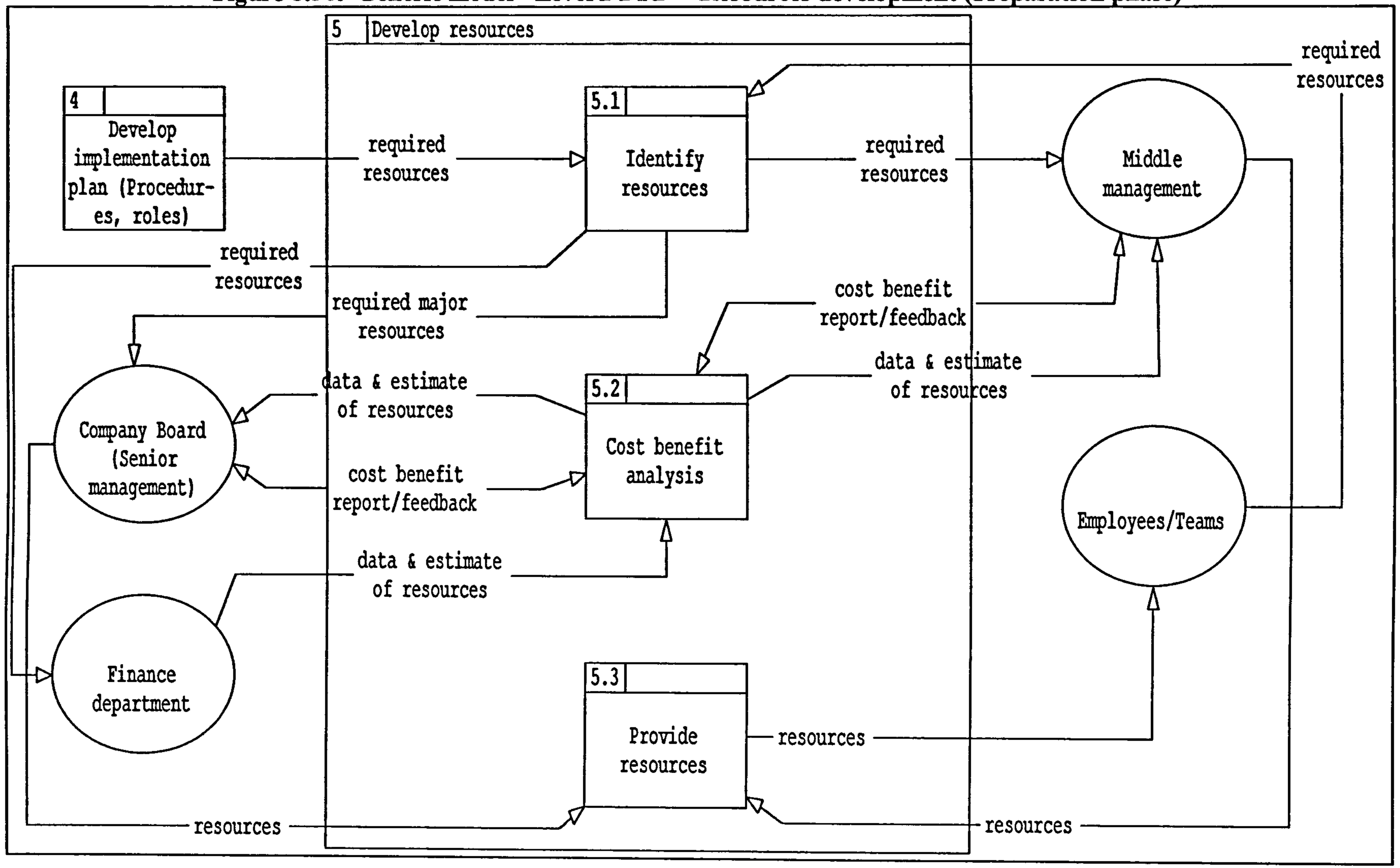
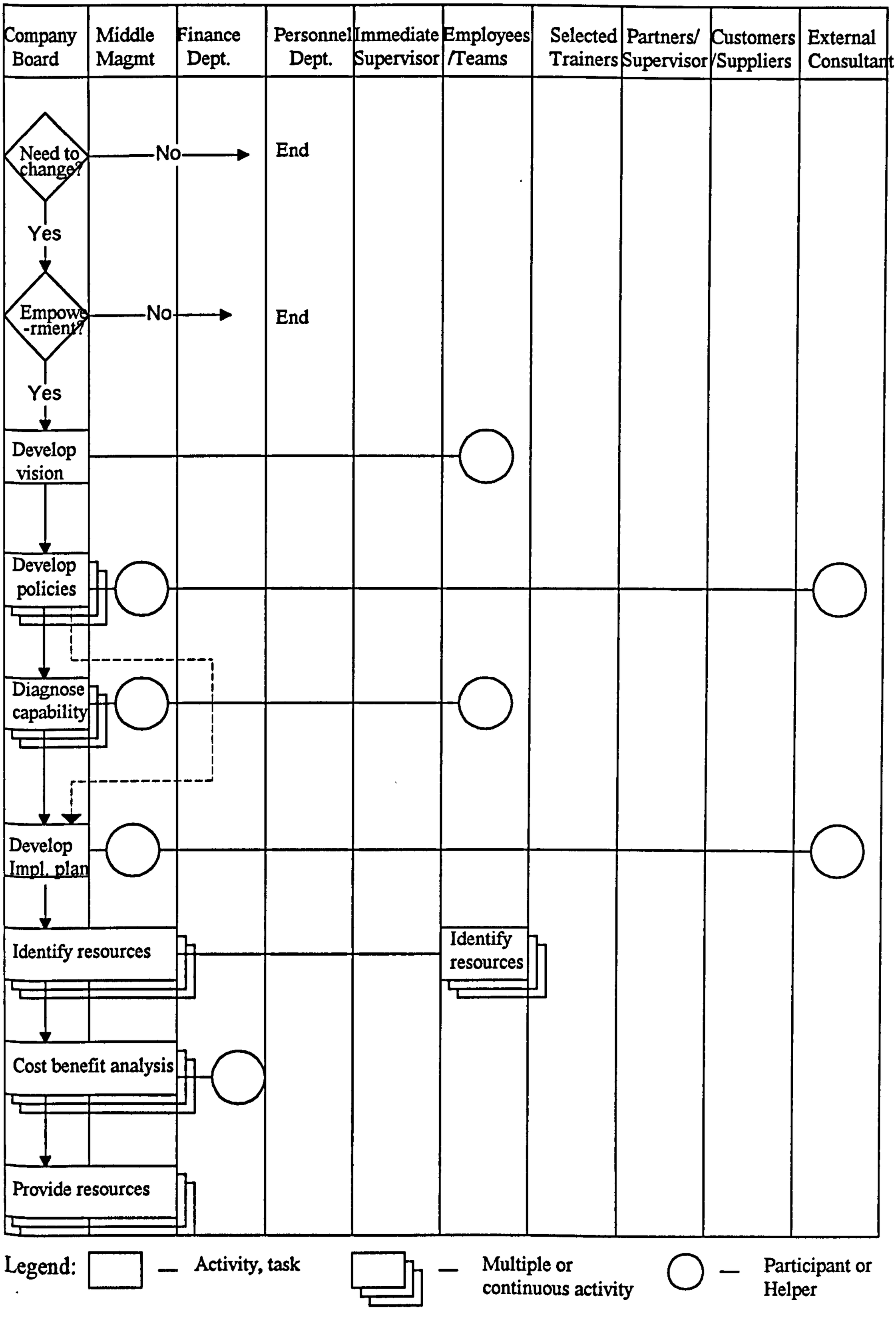


Figure 8.37. A flow chart of Preparation phase



8.6.2 Implementation phase

At the preparation phase, the preliminaries required for the implementation of empowerment including the company's vision, policy, plans, and necessary resources for the implementation are prepared. The actual implementation starts at the implementation phase. It can be seen from Table 8.5 that all of the three companies, in general, adopted a two stage major process: first, all companies have conducted initial training, where both the middle management and employees were trained on empowerment and teamwork principles and problem solving techniques. Second, committed employees were continuously trained on their business related skills. During the course of training, successful performers, who were perceived as having acquired sufficient knowledge and skills to perform their jobs independently with less or no supervision were certified. There have been some variations between companies in these approaches. Company A conducted Information sessions and offered initial training on empowerment to the regional level management and some selected employees from lower levels of the organisation. Where as, companies B and C offered this initial training to all employees of the organisation. On the other hand, in all companies, the senior management (Main Board) conducted these sessions. Initial training to all employees rather than selected ones is important because it reduces scepticism among, and increases motivation of, employees to adopt empowerment. Before the initial training, the senior management (Group Steering Committee in company A and the Quality Management Team in company C) was trained by external consultants. After the initial training, regional management and employees (in all three companies) were empowered to decide on adopting empowerment. In companies B and C, regional management consulted their employees to implement empowerment within their regions. After the commitment to empowerment, both companies A and C have established Personnel development folders for each of the employees. These were established by employees' immediate supervisors. Employees'

performance improvements, skill developments and other details of progress were observed by supervisors and recorded on the folder for future reference. Company B did not use this approach. However, before authorisation of employees acting as empowered individuals, continuous exercise of this task would enable both the management and individuals to continuously track the skill deficiencies of employees and take appropriate remedial action for improvement.

Continuous training was the core issue during the implementation phase in all companies. The training process overall looks similar across them also, however, the role of the participants slightly varies. The training process starts with first identifying training needs for every individual, followed by preparing training schedules and topics and then arranging training. Finally, monitoring training effects by observing performance at work takes place. In all of the companies, training needs for individuals were identified jointly by both supervisors and employees. Then, Training Departments at regional level in company A, company level in company B, and the Personnel Department in company C were responsible for offering training to employees. In both company A and B, a pool of selected experts comprised the Training Department, prepared schedule and topics of training (based on the needs reported to them) and offered training. However, in company C, the trainers were selected directly from employees as and when required, and both the Personnel Department and a separate Training Co-ordinator took the responsibility to prepare schedules and topics and arranged training. This approach seems more effective than the approach of companies A and B, because the trainers are selected directly from a large pool of employees (based on the topic) which enables one to identify the appropriate individual (expert) who can effectively train on the relevant topic. Where as, training by only a few selected experts of the Training Department is restrictive. It is more difficult to choose the right person to deliver training, because those selected trainers may not have sufficient knowledge on some of the topics needed by employees. Regarding training

effects, companies A and C used a similar approach, where these effects were observed by individuals' supervisors. Company B encouraged employees to observe their own training effects. At this stage, it seems illogic to ask employees to assess their performance themselves, because the above training process is continuous until employees are found to have achieved sufficient skill for managing their own process (including self-assessment of performance). Since employees are still receiving training towards achieving sufficient skills for empowerment, during the course of this training, self-assessment of performance might be counter productive. Thus, self-performance assessment after acquiring sufficient skills would be beneficial rather than during the training period. Finally, in all companies, those individuals who have achieved sufficient skills to operate as empowered employees were authorised. Companies A and C used a certification system for this authorisation. The Training department in company A and the Personnel department in company C issued skill certificates.

Employee attitudes and their grievances were identified and analysed, and remedial actions were undertaken to solve them. This process was started during the implementation phase and was continuous during the sustaining phase. Employee attitudes were periodically surveyed through questionnaires by middle management (regional level) in company B and senior management (Main Boards and senior staff) in companies A and C. In companies A and C, this process was centralised which avoided the duplication of survey assessment, first at regional level and then at company level. All companies encouraged employees to report their grievances at work. At companies A and B it was informal, unlike company C where apart from informal means, grievances were first reported to immediate supervisors. Minor grievances were addressed by immediate supervisors. The major ones were forwarded to senior management.

Best practices for the implementation phase

Based on the above discussion and involvement of key participants, the following key best practices are identified for the optimisation of the implementation phase. The major entities (participants) who played a greater role during the implementation phase were identified, they are: Company Board (Senior management); Middle Management; External Consultants; Immediate Supervisor; Employees/Teams; Personnel Department; and Selected Trainers.

Initial training

- Senior management (including the Group Board) receives training on empowerment related issues.
- Senior management conducts a series of workshops to train employees (including middle management) on empowerment, problem solving tools and techniques, and teamwork principles.
- Departments/sections and employees are encouraged to adopt empowerment voluntarily.
- Supervisors of individuals establish Personnel Development Folders to follow up both their performance and skill improvements.

Training

- Training needs of individuals are identified by both the supervisor and the individual.
- The personnel department prepares schedules and topics (from the training needs reported to it) for training, and identifies suitable trainers (amongst employees) for the training topics.
- Supervisors continuously tracks performance and skill improvements of individuals, and recommends for skill certification for having obtained sufficient ability to act as

empowered individuals. Information regarding these follow up measures are documented in the Personnel Development Folders.

Attitudes and grievances

- The senior management continuously observes employees' attitudes (on involvement, satisfaction, and problems) towards jobs and takes remedial actions.
- The senior management, middle management, and supervisors at their respective levels observe any grievances from employees and solve them promptly.

Generic model of the implementation phase

Based on the key best practices for the improvement of the implementation phase, as identified above, the processes and respective data flows (of the implementation phase) of all of the three companies were analysed, and a Generic DFD (GDFD) model for the implementation phase was developed (see Figures 8.38 and 8.39). The data description of the DFD model of the implementation phase is described below.

INDUCTION WORKSHOPS (*Entry type*: Process)

Specification: This process deals with the following data: awareness, problem solving and teamwork principles; and initial training and training strategy. Initially, the Company Board (senior management) receives training from external consultants. These consultants also assist senior management in producing an appropriate strategy for training employees. Then, a series of workshops are conducted by senior management to train both the middle management and employees on these issues.

INITIAL TRAINING & TRAINING STRATEGY (*Entry type*: Data element)

AWARENESS, PROBLEM SOLVING & TEAMWORK PRINCIPLES (*Entry type*: Data element)

ESTABLISH PERSONNEL DEVELOPMENT FOLDER (*Entry type*: Process)

Specification: This process deals with the following data: details; personal details and performance; established folder; personal development folder; and observed performance. Personnel Development Folders are established for every individual by their immediate supervisors. Individuals' performance and other details including skill, training and so on are observed both by supervisors and individuals. The details are recorded in the folder by the supervisor for future reference.

DETAILS (*Entry type*: Data element)

PERSONAL DETAILS AND PERFORMANCE (*Entry type*: Data element)

ESTABLISHED FOLDER (*Entry type*: Data element)

OBSERVED PERFORMANCE (*Entry type*: Data element)

PERSONAL DEVELOPMENT FOLDER (*Entry type*: Data store)

CONTINUOUS TRAINING (*Entry type*: Process)

Specification: This process deals with the following data: training needs; trainers; request for trainers/feedback; training schedule/topics; learned skills; education and skills; training effects; sufficiently skilled employees; training certificate; and certification details (see Figure 8.39). Both employees and supervisors jointly identify skill deficiencies and needs for training, and report to the personnel department, who prepares schedules and topics and selects suitable trainers specific to subject modules, and arranges training. Effects of training are observed and documented by supervisors. Successful performers who are perceived as acquired sufficient skills to act as empowered individuals are recommended to the personnel department for certification.

TRAINING NEEDS (*Entry type*: Data element)

REQUEST FOR TRAINERS/FEEDBACK (*Entry type*: Data element)

TRAINERS (*Entry type*: Data/Resource element)

REQUEST FOR TRAINERS (*Entry type*: Data element)

TRAINING SCHEDULE/TOPICS (*Entry type*: Data element)

LEARNED SKILLS (*Entry type*: Data element)

EDUCATION & SKILLS (*Entry type*: Data element)

TRAINING EFFECTS (*Entry type*: Data element)

SUFFICIENTLY SKILLED EMPLOYEES (*Entry type*: Data element)

TRAINING CERTIFICATE (*Entry type*: Data element)

CERTIFICATION DETAILS (*Entry type*: Data element)

EMPLOYEE ATTITUDE SURVEY (*Entry type*: Process)

Specification: This process deals with the following data: questionnaires/feedback; satisfaction, problems, grievances; training and awareness needs; results; and grievances. The senior management (company board) continuously observes employees attitudes including satisfaction levels and problems with their jobs through periodic questionnaire surveys. Results are published and disseminated back to employees. Based on the results, further actions are taken for improvement. Any training or awareness needed by employees, as perceived from the survey analysis, are reported to the personnel department.

QUESTIONNAIRES/FEEDBACK (*Entry type*: Data element)

SATISFACTION, PROBLEMS, GRIEVANCES (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

GRIEVANCES (*Entry type*: Data element)

TRAINING & AWARENESS NEEDS (*Entry type*: Data element)

GRIEVANCES SOLVING (*Entry type*: Process)

Specification: This process deals with the following data: grievances; solved minor grievances; grievances solved; major grievances; and solved major grievances. Grievances are identified by several means, including Employee attitude surveys and from employees grievances reporting. Grievances perceived by employees are reported to supervisors, who solve minor problems, and forwards the major ones to either the senior management or middle management depending on the nature of the problem.

GRIEVANCES (*Entry type*: Data element)

SOLVED MINOR GRIEVANCES (*Entry type*: Data/resource element)

MAJOR GRIEVANCES (*Entry type*: Data element)

SOLVED MAJOR GRIEVANCES (*Entry type*: Data/resource element)

GRIEVANCES SOLVED (*Entry type*: Data/resource element)

The generic Flow Chart model of the implementation phase

Figure 8.40 illustrates the flow chart model of the implementation phase. It can be seen from the figure that most of the processes are controlled by both the personnel department and senior management (Company Board), assisted or co-operated by supervisors. It can also be seen that none of the processes are solely undertaken by any one participant. In all of the processes several participants assist and/or co-operate to efficiently perform them, which ensures teamworking and optimal solutions.

Figure 8.38. Generic model - Level 1 DFD - Implementation phase

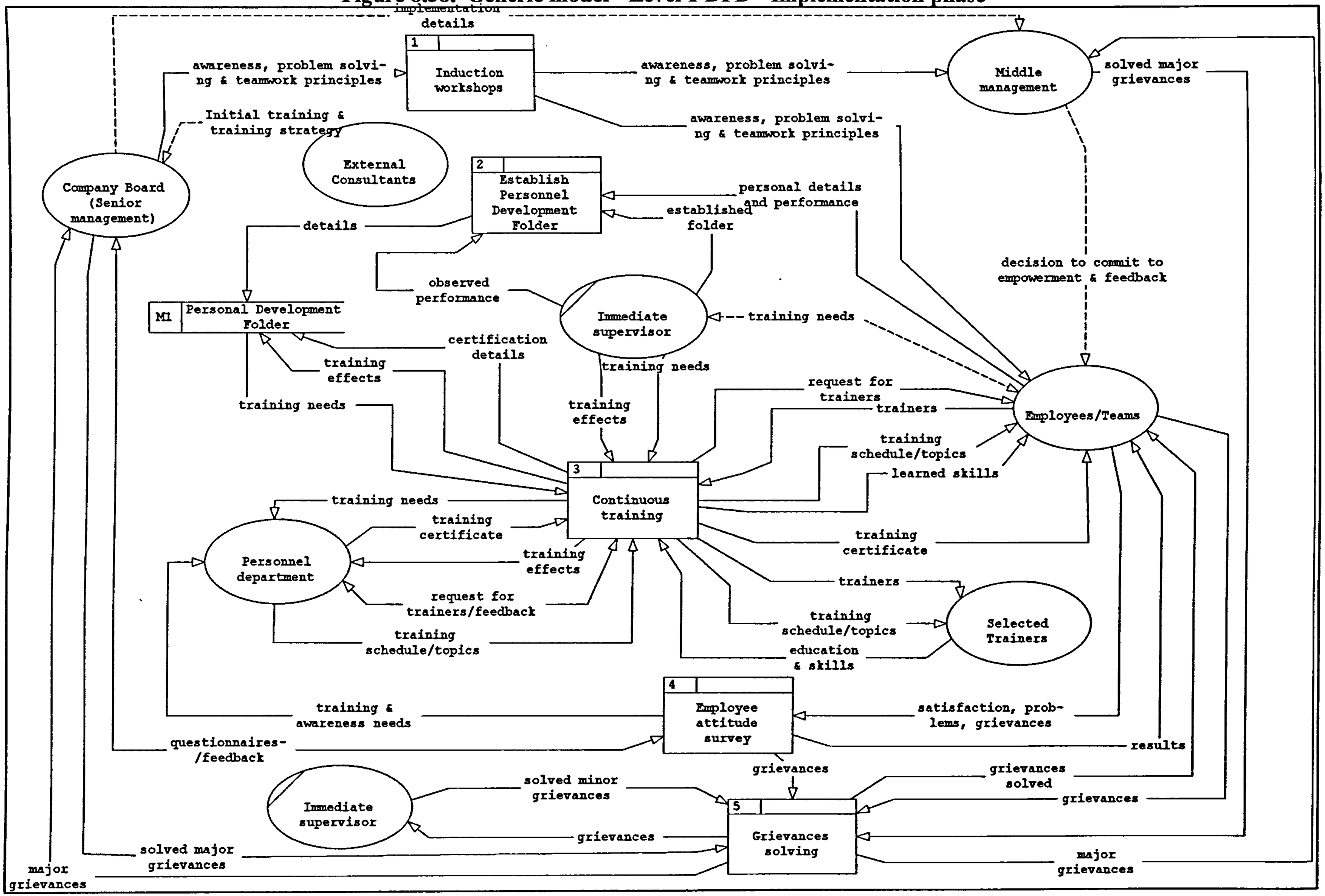


Figure 8.39. Generic model - Level 2 DFD - Training system (Implementation phase)

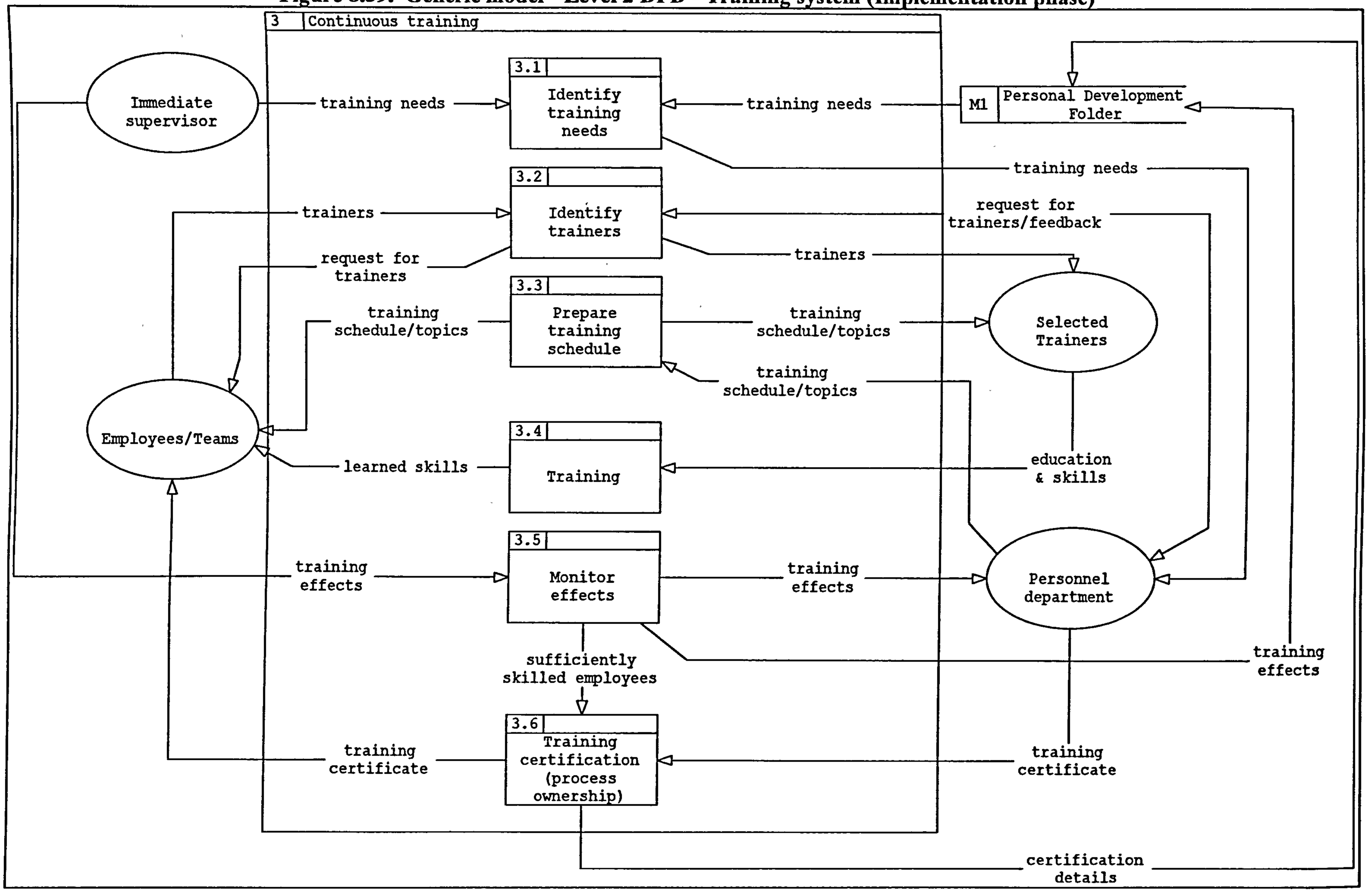
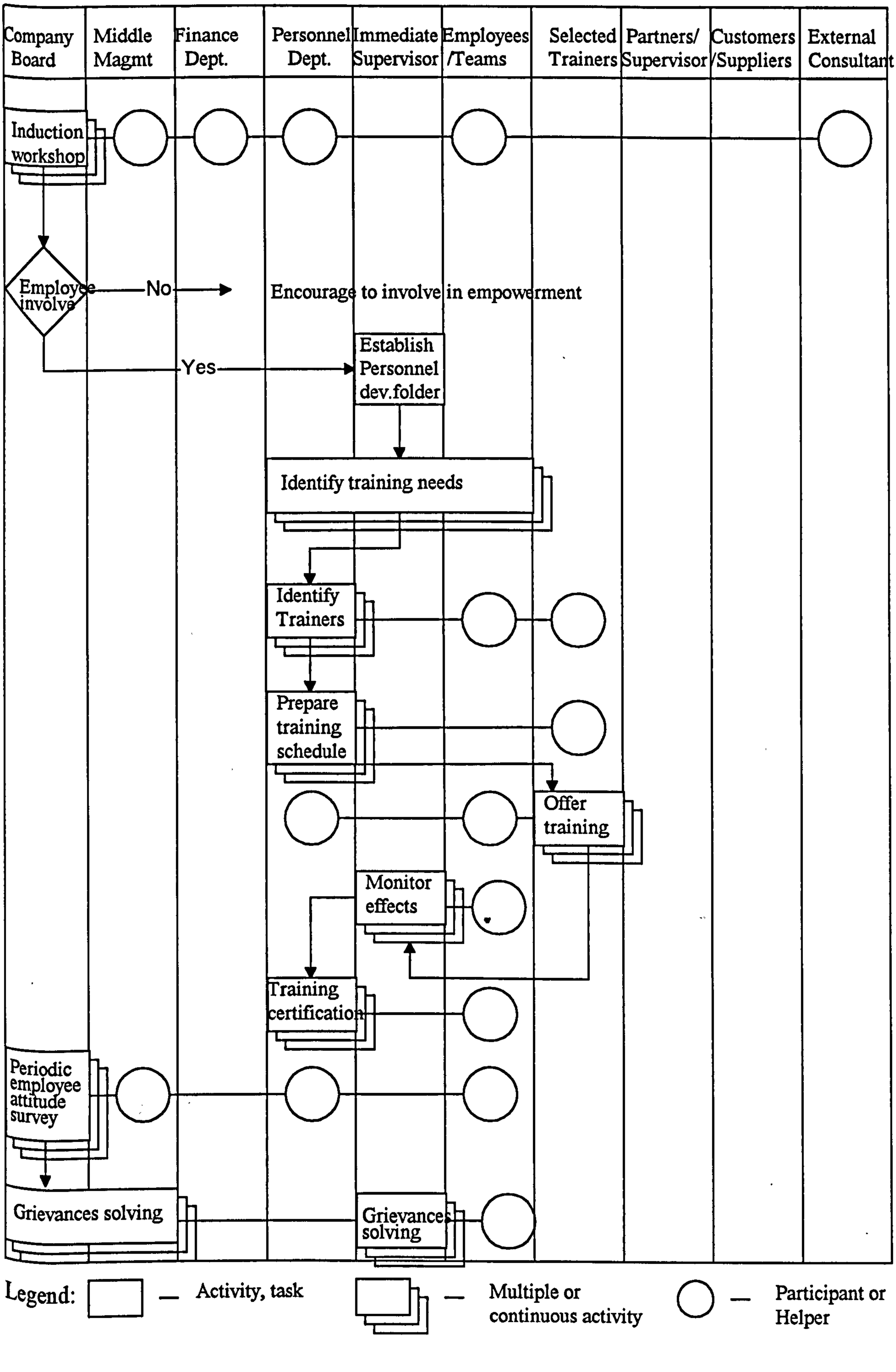


Figure 8.40. A flow chart of Implementation phase



8.6.3 Sustaining phase

Table 8.5 shows the key processes involved during the sustaining phase, they are: periodic survey/meetings (external); process improvements by senior management and departments; process improvements by employees or teams; company level performance measurements; and recognition of achievements. Besides some major differences amongst the case companies in the area of 'process improvements by employees', all adopted very similar approaches in the sustaining phase. First, for company level process improvements, all companies relied on feedback from external customers and suppliers. In addition to the internal problems, problems identified from this feedback was continuously used by both departments/sections and employees at various levels of the organisation for process improvements. Improvement solutions were implemented and performance, both individual and at company level were measured and benchmarked with competitors. Finally, highest performers were recognised by supervisors and senior management.

External feedback on company performance was obtained by several means including, questionnaire survey, meetings, conferences, and seminars. These were mainly conducted by both the company's Main Board and regional level management in companies A and C, and only by regional level management in company B. As in company B, external contacts for feedback by only regional level management lead employees to use only those problems identified at their own regional levels; problems identified by other regions are ignored. In this case, involvement of senior management in collectively identifying problems at company level would help employees of all regions to address both company level and regional level problems.

Having identified company level problems, the next step was to produce improvement plans for solving them. In company A, Task Teams at company level were established,

which analysed the problems and offered solutions. These solutions were passed on to regional level management, which in turn identified suitable individuals or teams to implement them. However, in companies B and C, departments or sections (at regional level) produced improvement plans, and identified respective individuals or teams for implementing them. This indicates that company level problems can be solved very flexibly both at company level and regional level. The important aspect in this process is that every individual in the organisation is well informed of company level problems (from the views of external participants). This enables everyone to improve their processes to achieve customer satisfaction.

The three companies varied in their approache to individuals' empowerment in improving the business process. Both companies A and C adopted similar approaches, where individuals continuously identified problems within their own processes, and developed improvement plans to solve them. These improvement plans along with their cost benefit analyses were submitted to the regional level management for approval. In company C, the finance departments assisted in such analysis. Approved Proposals were implemented, and performance was measured. In all of these processes, supervisors became facilitators and assisted individuals. However, company B adopted a self-development system which enabled employees to both continuously learn skills and solve problems for themselves. In this approach, employees identified dissatisfaction or discomfort related to their current state, and diagnosed themselves in terms of why they were currently dissatisfied and how to move forward from that state. This exercise resulted in the development of self-vision. In this process, everyone needed to have a partner who was either a manager, supervisor or colleague, to listen and assist in discovering right solutions. The self-vision continuously enabled individuals to identify problems with their processes and subsequently identify training needs to improve their skills. The Training Department continuously assisted them to acquire sufficient skills to effectively perform their duties.

Any problems identified from their self-visions were assessed and solutions implemented with the assistance of partners. Finally, a 360 degree appraisal survey was conducted to both assess self-improvements and identify further problems for improvements. This survey was conducted amongst relevant participants (colleagues, external customers and suppliers). Results of this survey were reported to the Regional Management Team. This approach gives freedom to individuals to approach anybody in the organisation and seek assistance or advice in their development process; thereby facilitating a flexible team approach with identified experts, and enhanced sharing of knowledge and expertise. The weakest part in this self-development approach of company B was that, individuals did not conduct evaluation of their proposals (processes) in terms of cost benefit analysis. Where as companies A and C did.

Company level performance was measured in all cases. These results were benchmarked with identified competitors in companies A and B. In all companies, the senior management (main board) was responsible for this task. Data were collected from several sources including the performance assessments of individuals, employee attitude surveys, and financial statements from finance departments. Finally, results were disseminated to employees.

Recognition of achievements was seen as one of the important motivational factors for encouraging employees to become involved in the business for improvements. Partners or supervisors first recognised the accomplishments and reported to regional or senior level management, which in turn analysed those accomplishments and selected highest performers. The selected accomplishers were finally rewarded in a ceremonial occasion. In addition, Company C awarded external participants (including sub-contractors and suppliers) with 'supplier of the year award' and 'sub-contractor of the year award'. Besides

these formal techniques, employees were always thanked personally by senior management.

Best practices for the sustaining phase

Based on the above discussion and involvement of key participants, the following key best practices are identified for the improvement of the implementation phase. The major entities (participants) who played a greater role during the sustaining phase were: Company Board (Senior management); Middle Management; Partners/Supervisor; Task Teams/Individuals; Employees/Teams; Personnel Department; Colleagues/customers and suppliers; Finance department; and Competitors.

Process improvements by senior management/department

- Both the senior management and middle management periodically assess expectation and problems posed by external customers and suppliers by conducting surveys and meetings with them, and observing company level problem areas.
- Establish company level or middle level task teams or identify individuals at respective levels to analyse company level problems and produce improvement plans.
- Distribute both company level and middle level improvement plans to all relevant employees to enable them to incorporate those plans in their day-to-day business.

Self-management system

- Individuals identify appropriate partners to co-operate, advise, and assist them in their self development process.
- The partners can be either the supervisor or anyone who is able to cooperate in their improvement processes.

- Based on both company level/regional level problems and problems emerged from their own business, individuals continuously identify opportunities for improvements in their process and identify any deficiencies in their skills.
- Any problems or ill structured processes identified are analysed and improvement plans are proposed.
- Improvement plans or proposals are evaluated for their cost-benefits with the assistance of the finance department.
- Any deficiencies in skills identified are solved by further training with the assistance of the personnel department.
- Individuals continuously conduct an appraisal survey on their performance with everyone (including senior management, supervisors, partners, colleagues, and both internal and external customers and suppliers) related to their processes.
- Any problems or deficiencies observed from self-performance measurements (appraisal survey) are continuously analysed for further improvements.
- Partners assist individuals and offer suggestions in all of the above self-development processes.

Group level performance assessment

- Based on performance data obtained from all sources including, self or team/department performance improvements, financial performance, and employee surveys, the senior management analyse company level performance.
- The senior management benchmarks company level performance with identified business competitors.
- The senior management publishes both successes and failures to employees and external customers and suppliers.

Recognition

- Successful performers including teams or departments are recognised by awards and gifts.

Generic model of the sustaining phase

Based on the above key best practices for the improvement of the sustaining phase, the processes and respective data flows (of the implementation phase) of all of the three companies were analysed, and a Generic DFD (GDFD) model for the sustaining phase was developed (see Figures 8.41 to 8.44). The data description of the DFD model of the sustaining phase is described below.

PERIODIC SURVEY (*Entry type*: Process)

Specification: This process deals with the following data: list of customers/suppliers; and expectations/problems. Both customers and suppliers are involved through periodic surveys or meetings, where, their requirements and perceptions on the service provided by the company are shared. Both Company Board (senior management) and the Middle Management are involved in these activities and identify problems for improvements.

LIST OF CUSTOMERS/SUPPLIERS (*Entry type*: Data element)

EXPECTATIONS/PROBLEMS (*Entry type*: Data element)

PROCESS IMPROVEMENTS BY SENIOR MANAGEMENT/DEPARTMENT (*Entry type*: Process)

Specification: This process deals with the following data: expectations/problems; middle level improvement plans; company level task teams; middle level task teams; company level problems; company level improvement plan for approval; middle level improvement plan for approval; company level improvement plan; improvement plans/feedback; and established team/identified individual (see Figure 8.41). One of the main sources for identification of company level problems is contacts with external customers and suppliers.

Once a major problem is identified the Company Board establishes Task Teams to explore the problem. The company level Task Team studies the problem, produces company level improvement plan, and submits this to the Company Board for approval. The approved plans are distributed to middle level management including all departments, which, in turn establish middle level Task Teams (depending upon the need) or identify appropriate individuals to produce middle level improvement plans. Both company level and middle level improvement plans are distributed to all employees for adoption in their business.

EXPECTATIONS/PROBLEMS (*Entry type*: Data element)

COMPANY LEVEL PROBLEMS (*Entry type*: Data element)

COMPANY LEVEL TASK TEAMS (*Entry type*: Data element)

MIDDLE LEVEL TASK TEAMS (*Entry type*: Data element)

ESTABLISHED TEAM/IDENTIFIED INDIVIDUAL (*Entry type*: Data element)

IMPROVEMENT PLANS/FEEDBACK (*Entry type*: Data element)

COMPANY LEVEL IMPROVEMENT PLAN FOR APPROVAL (*Entry type*: Data element)

MIDDLE LEVEL IMPROVEMENT PLANS (*Entry type*: Data element)

MIDDLE LEVEL IMPROVEMENT PLAN FOR APPROVAL (*Entry type*: Data element)

COMPANY LEVEL IMPROVEMENT PLAN (*Entry type*: Data element)

SELF MANAGEMENT SYSTEM (*Entry type*: Process)

Specification: This process deals with the following data: invitation to partners; agreement to partnership; signed agreement; vision; assistance/comments/suggestions; self-vision/feedback; improvement areas/problems; training needs if any; proposals; plans for improvement/feedback; training/assistance; learned skills; assistance/estimate; analysis report; analysis report/feedback; performance; results; and questionnaires/feedback (see Figure 8.43). Empowered employees identify and invite partners to cooperate, listen and assist in discovering right solutions for problems. In this process, employees identify

dissatisfaction or discomfort related to their current state, and diagnose themselves in terms of why they are currently dissatisfied and how to move forward from that state. This includes the adoption of departmental improvement plans within their processes. This exercise results in the development of self-vision. The self-vision continuously enables individuals to identify problems within their processes and simultaneously identify training needs to improve their skills. The Personnel Department continuously assists them to acquire sufficient skills to effectively perform their duties. Any problems identified from their self-visions are assessed and solutions (proposals) are developed (along with their cost benefit analysis), and implemented with the assistance of partners. The Finance Department assists them in analysing the cost benefits of their proposals. The proposals are submitted to the respective middle level management for comments. Finally, a 360 degree appraisal survey is conducted to both assess self-improvements and identify further problems for improvement. This survey is conducted with relevant participants (colleagues, external customers and suppliers). Results of this survey are reported to the middle management.

INVITATION TO PARTNERS (*Entry type*: Data element)

AGREEMENT TO PARTNERSHIP (*Entry type*: Data element)

SIGNED AGREEMENT (*Entry type*: Data element)

VISION (*Entry type*: Data element)

SELF-DEVELOPMENT VISION FOLDER (*Entry type*: Data store)

ASSISTANCE/COMMENTS/SUGGESTIONS (*Entry type*: Data/Resource element)

SELF-VISION/FEEDBACK (*Entry type*: Data element)

IMPROVEMENT AREAS/PROBLEMS (*Entry type*: Data element)

TRAINING NEEDS IF ANY (*Entry type*: Data element)

PROPOSALS (*Entry type*: Data element)

TRAINING/ASSISTANCE (*Entry type*: Data/Resource element)

LEARNED SKILLS (*Entry type*: Data element)

PLANS FOR IMPROVEMENT/FEEDBACK (*Entry type*: Data element)

ASSISTANCE/ESTIMATE (*Entry type*: Data/resource element)

ANALYSIS REPORT (*Entry type*: Data element)

ANALYSIS REPORT/FEEDBACK (*Entry type*: Data element)

FEASIBLE PROPOSALS (*Entry type*: Data element)

RESULTS (*Entry type*: Data element/results of implementation)

PERFORMANCE (*Entry type*: Data element)

QUESTIONNAIRES/FEEDBACK (*Entry type*: Data element)

COMPANY LEVEL PERFORMANCE MEASUREMENTS (*Entry type*: Process)

Specification: This process deals with the following data: data required/received; performance; financial data/assistance; analysis details/feedback; data; results; survey/feedback; feedback; and publications (see Figure 8.44). The Company Board (senior management) is responsible for this process. Company level measures include: performance of individuals observed from the self management system; financial data obtained from finance departments, and other surveys. All of these measures are periodically collected and assessed by the senior management. The finance department assists the senior management in financial calculations. Results of these measures are benchmarked against identified business competitors through surveys. Finally the results are published.

DATA REQUIRED/RECEIVED (*Entry type*: Data element)

PERFORMANCE (*Entry type*: Data element)

FINANCIAL DATA/ASSISTANCE (*Entry type*: Data/Resource element)

ANALYSIS DETAILS/FEEDBACK (*Entry type*: Data element)

DATA (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

SURVEY/FEEDBACK (*Entry type*: Data element)

FEEDBACK (*Entry type*: Data element)

PUBLICATIONS (*Entry type*: Data element)

RECOGNISE ACHIEVEMENTS (*Entry type*: Process)

Specification: This process deals with the following data: recommendation for award/presentations; selected accomplishers; and awards/thanks. Partners or supervisors recognise achievements and recommend to the middle management for an award or presentations by the accomplishers. The middle management select the highest achievements and awards them.

RECOMMENDATION FOR AWARD/PRESENTATIONS (*Entry type*: Data element)

SELECTED ACCOMPLISHERS (*Entry type*: Data element)

AWARDS/THANKS (*Entry type*: Data/Resource element)

The generic Flow Chart model of the sustaining phase

Figure 8.45 illustrates the flow chart model of the sustaining phase. It can be seen from the figure that almost all levels of the organisation are involved in developing business processes and performance. It can be seen that empowered employees or teams play a greater role in improving the performance of the company. Company level problems and solutions (plan) are provided to employees by both senior management and middle management. Having these inputs, employees implement them at their own business levels, in addition to their own efforts for process improvements. Having obtained company level problems and improvement plans, in addition to problems at their own business level, employees continuously develop their own vision and improvement plans, and subsequently improve their skills to improve their job performance.

Figure 8.41. Generic model - Level 1 DFD - Sustaining phase

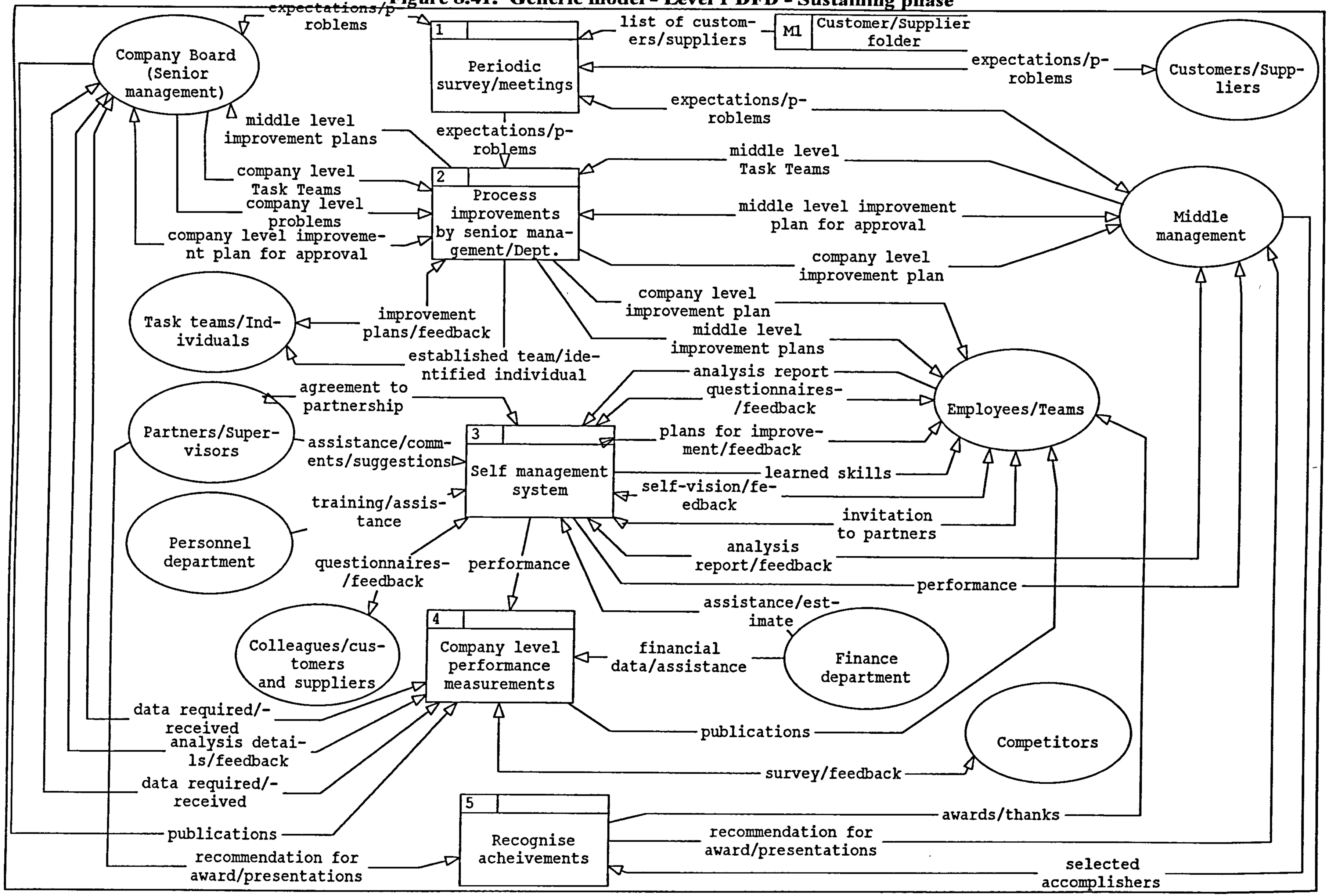


Figure 8.42. Generic model - Level 2 DFD - Process improvement by senior management/Department (sustaining phase)

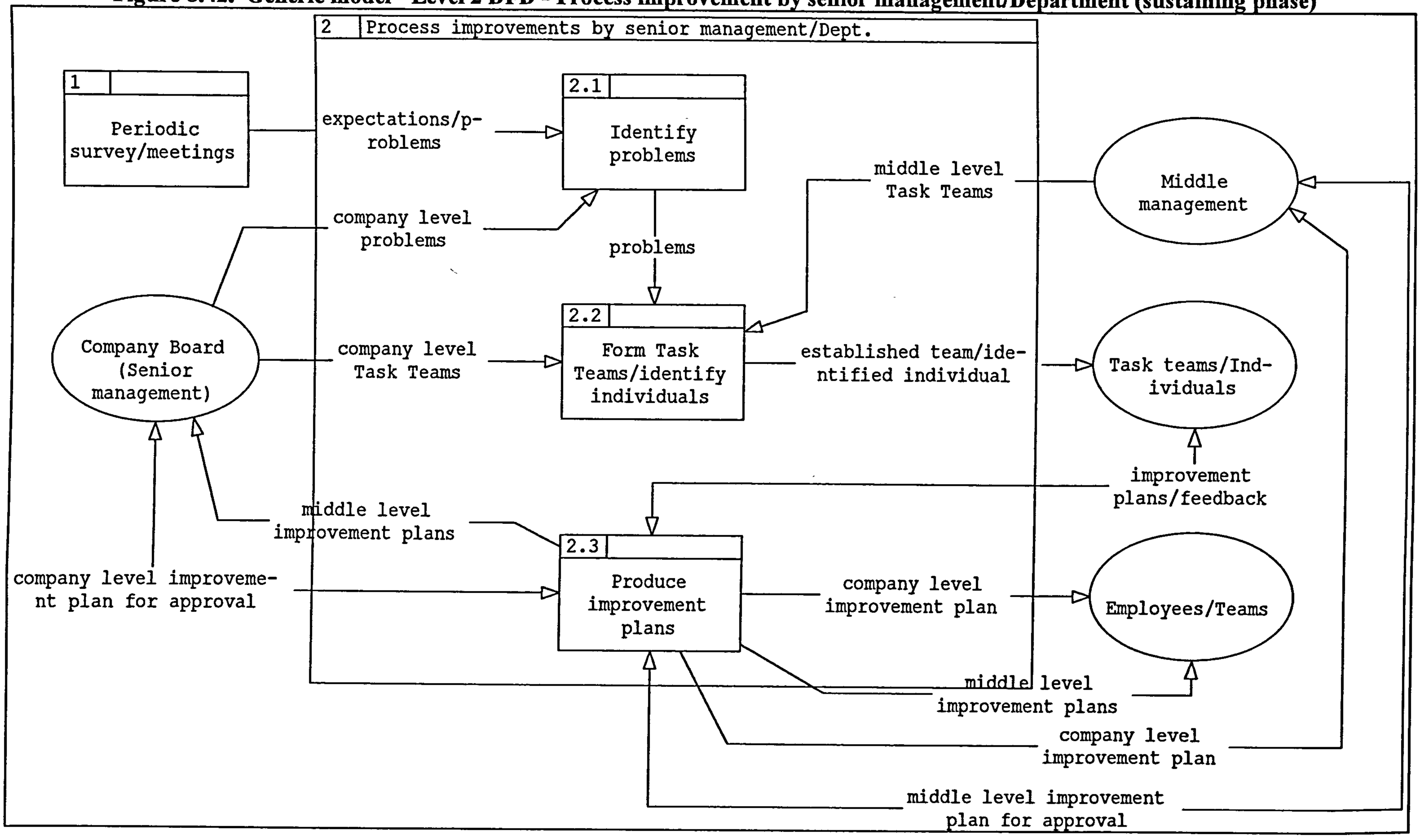


Figure 8.43. Generic model - Level 2 DFD - Self management system (Sustaining phase)

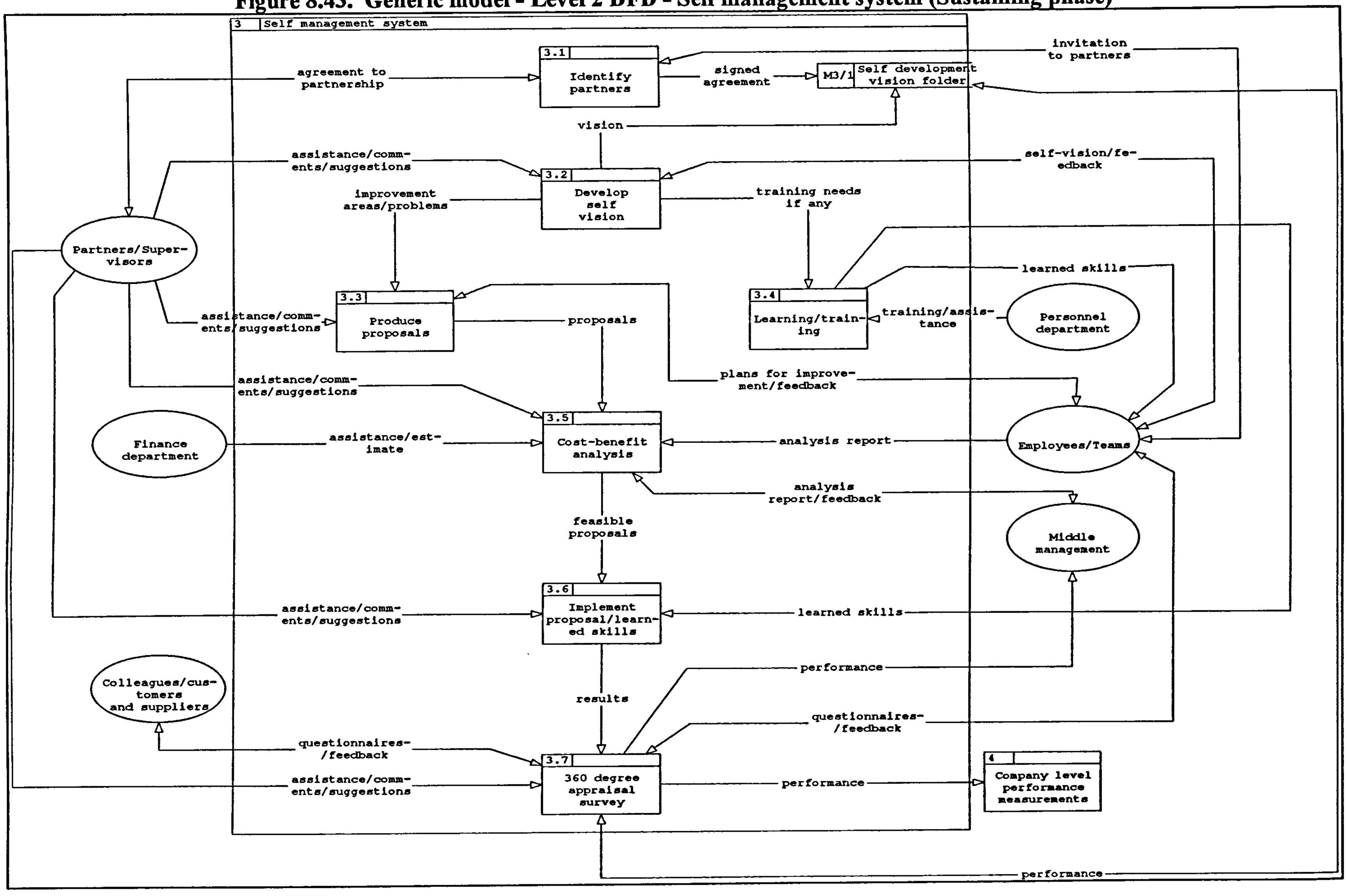


Figure 8.44. Generic model - Level 2 DFD - Company level performance measurements (sustaining phase)

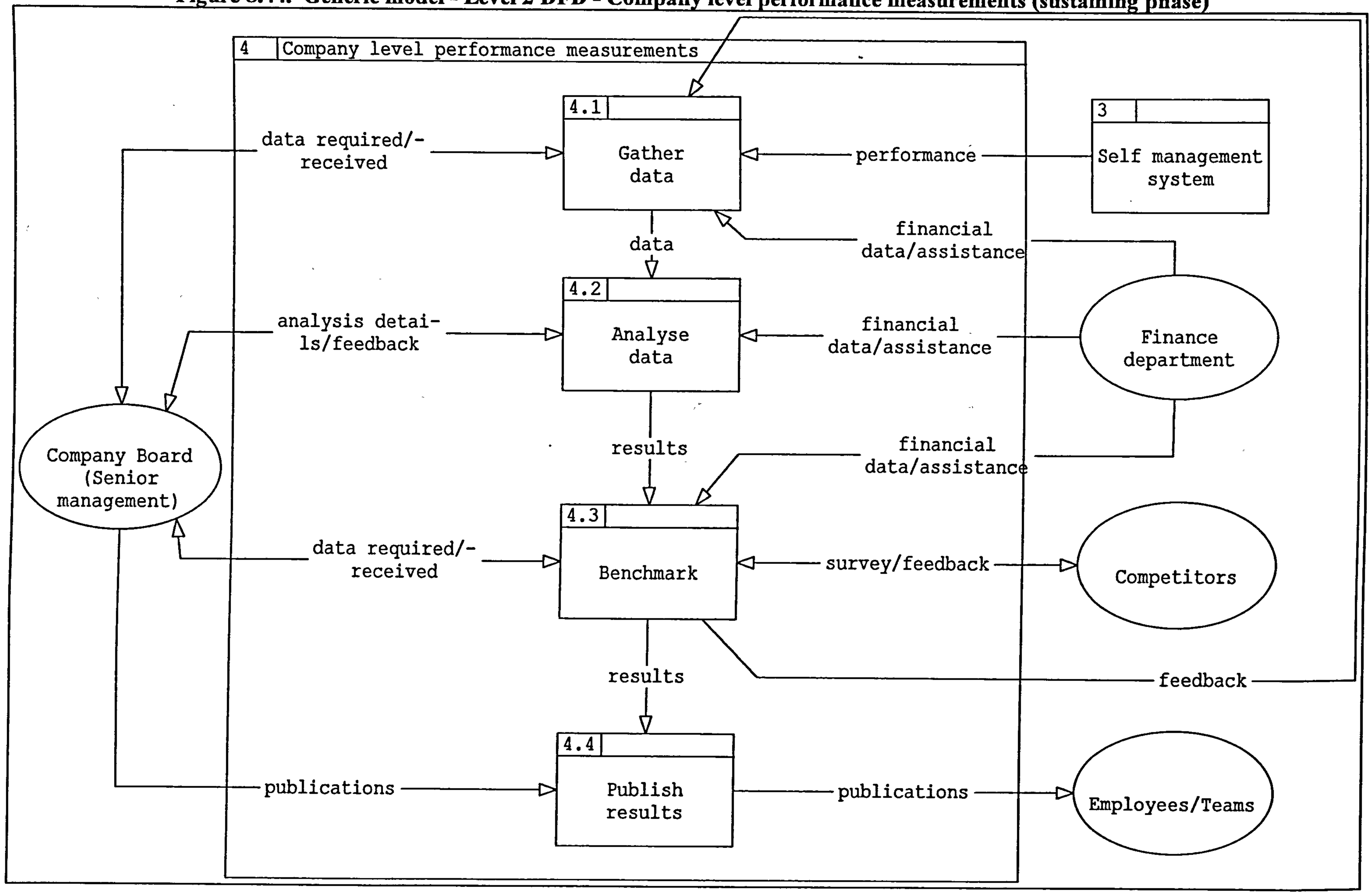
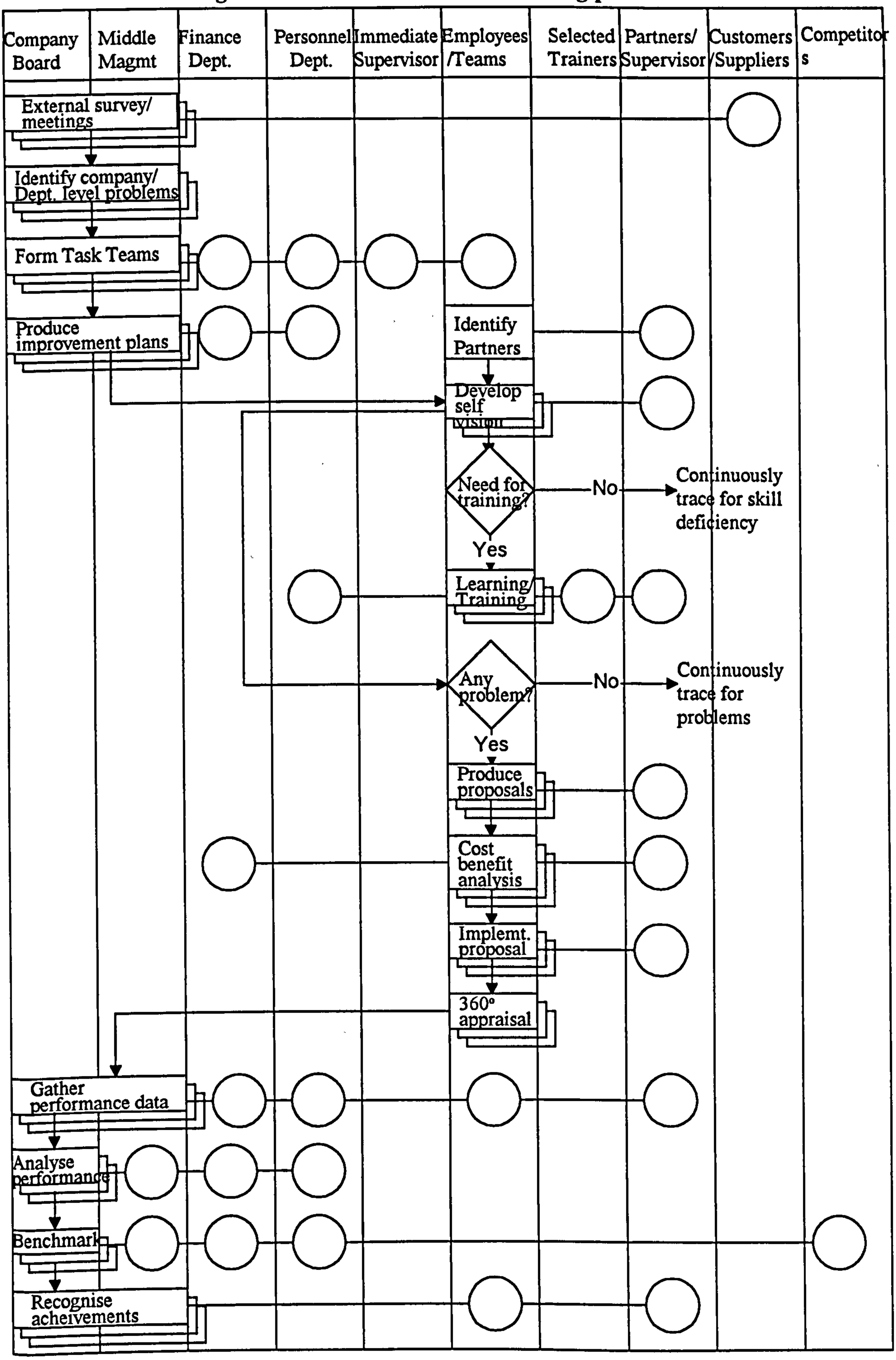


Figure 8.45. A flow chart of Sustaining phase



8.6.4 Conceptual model of the implementation process of empowerment

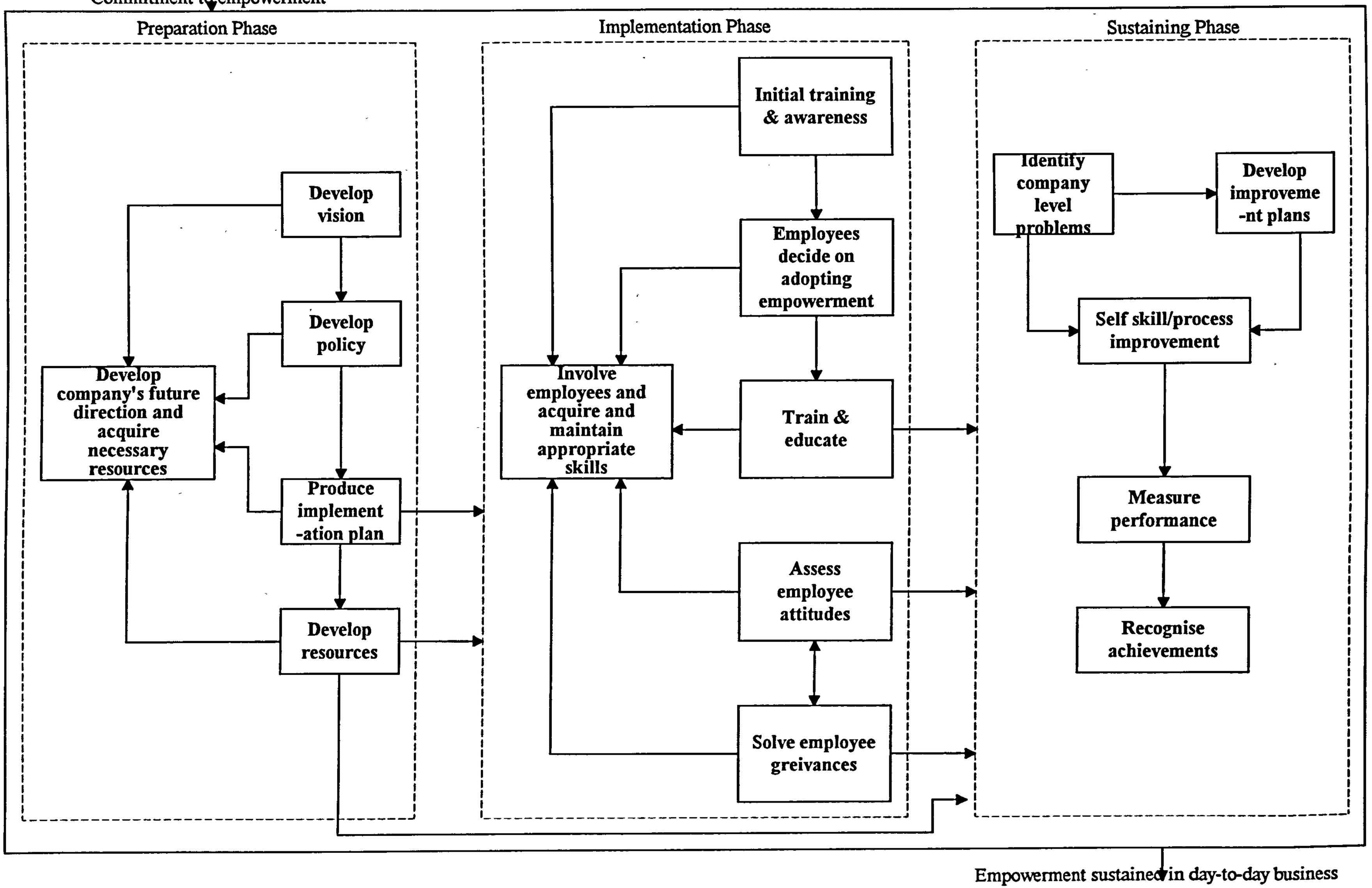
The rationale of development of a conceptual model in this research has been described in detail in Chapter 7. Conceptual models describe what a system does; i.e. what (activities) should go on in the system. It does not tell how the activities are performed. However, information systems are 'hard' systems which describe, for each activity or process: What information is needed to do it? In what format? From what source? and How frequently? So far, the GDFDs developed for the implementation of empowerment deal with the hard system. Since the case studies investigated current physical systems of empowered organisations (i.e.What information is needed to do what process? In what format? From what source? and How frequently), those systems had to be expressed only through a (hard) information system. However, owing to the situation that implementation systems need to be designed by addressing specifically the characteristics of an individual organisation, development of a conceptual model was thought of aiding practitioners to use it to develop a hard system with respect to their own organisations. However, a detailed approach shown in GDFDs can be used to learn details of physical implementation of the conceptual model.

Figure 8.46 illustrates the conceptual model of the empowerment implementation process. The model distinguishes three separate phases of implementation as discovered in the DFD models. In the preparation phase, company's future directions and goals are established, and subsequently, necessary resources required for the achievement of the goals are established. This includes four key tasks: development of company level vision; development of appropriate quality and employee (empowerment) policy; development of implementation plans for implementing the policy; and development of appropriate resources including fund, suitable organisational structure, and so on.

During the implementation phase, suitable strategies are adopted to involve employees in the change process, and make them continuously acquire sufficient skills and knowledge to act as empowered employees. These include: initial training to make employees aware on empowerment and related principles, and training them on problem solving techniques and teamwork principles; encourage employees to voluntarily be involved in the change process; continuously train and educate employees regarding their business related activities; continuously assess employee attitudes including satisfaction and grievances towards change; solve their grievances once they are perceived. It can be seen that both the preparation and implementation phases seek full commitment and involvement by both senior and middle management in providing a suitable environment for employees to adopt empowerment.

Sufficiently skilled employees, in the sustaining phase, act as empowered individuals. In addition to their own process level problems, they incorporate both company level problems and improvement plans at their business level and continuously strive for improvements in their processes. This includes continuous improvement in their skills by continuously identifying their deficiencies in business related skills, and subsequent learning. This indicates that the whole organisation becomes a learning organisation. The effects of both learning and improvement plans applied to the business are measured at all levels of the organisation. Continuously, best performers are recognised.

Figure 8.46. Conceptual model of the implementation process of empowerment



In essence, the model indicates that empowerment of employees is not a separate issue to be solely dealt with, but rather, it seeks several inputs from both individuals and management (for effective implementation). Involvement of senior management in developing company vision and associated policies is important because, without which empowered individuals will have no common goals to strive for. Provision of a suitable environment including ,access to resources, continuous training, and partnership between management and individuals, is crucial. Without such empowered individuals will face problems such as: inefficient performance due to lack of sufficient resources; incompetence due to lack of sufficient skills; rework and errors due to lack of participation and lack of sharing of knowledge and ideas between management and individuals.

8.7 Performance of case companies since implementation of empowerment

Although it was not the aim of this research to analyse in detail the business performance of companies with respect to implementation of empowerment, the research, in general, observed the overall strategic and operational level performance of the case companies. Previous research (Mann, 1992) has concluded that both operational and strategic performance of a business organisation could not be directly compared with implementation of a new concept within the organisation. However, it stated that an organisation's business performance before and after the implementation can be compared so as to assess the effect of implementation. Thus, both structured interviews and documented evidence were used to: identify whether companies measure the effects of empowerment implementation; and observe their effects on both strategic and operational business performance. Not surprisingly all of the case companies have not measured their business performance (strategic and operational) with respect to implementation of empowerment. A similar trend was perceived when Mann (1992) attempted to explore the effect of implementation of TQM in manufacturing organisations, where none of the

organisations had measured their performance with respect to TQM implementation. One of the main reasons reported was that business performance not only relies on internal improvements within an organisation, but also depends on several external influences including, environment, market, economy, location and so on. Taking account of this conclusion, this research did not explore in detail the business performance with respect to implementation of empowerment for the case study companies. However, some of the observed performance measures including, employee attitudes, waste efficiency, customer satisfaction, turnover, and safety is being measured by companies A and C and are reported in their respective units of analysis (see Figures 8.8, 8.9, and Table 8.1, 8.2, 8.3, and 8.4) . The results indicated that the companies have been enjoying a number of improvements since the implementation of empowerment, including: improvements in annual turnover; less waste and less rework; increased employee involvement; and increased sutomer satisfaction. These results were further endorsed by asking the respective informants of each of the companies as to how would they evaluate their companies' performance (with respect to strategic and operational business) improvements since the implementation of empowerment. The results of responses are presented in Table 8.6, which shows that companies' performance (strategic and operational business) have improved after the implementation of empowerment. Of course it would be incorrect to assume such improvements are solely the result of empowerment implementation, however, they are indicators that there is substantial correlation between the empowerment implementation and performance improvement.

Table 8.6. Case companies' (A, B, and C) response over their strategic and operational business performance

Performance	Yes	No	Do not know
Strategic performance			
Increased market share generally	**A, B, C**		
Increased turnover generally	**A, B, C**		
New customer base	**A, B**		**C**
Operational performance			
Increased quality of the service/product	**A, B, C**		
Increased working to schedule	**A, B, C**		
Increased productivity of employees	**C**		**A, B**
Increased skill of employees	**A, C**		**B**
Increased employee satisfaction	**A, B, C**		
Increased communication among employees	**A, B, C**		
Increased communication with customer/supplier	**A, B, C**		
Reduced construction time	**A, C**		**B**
Reduced rework	**A, B, C**		
Reduced material waste	**A, B**	**C**	
Reduced construction changes	**A, B, C**		
Reduced hazards	**A, B, C**		
Reduced employee turnover	**A, B**		**C**
Reduced accidents at site	**A, B, C**		
Reduced customer compliants	**A, B**	**C**	

Cost of quality

'Cost of quality' was one of the main measurement criteria assessed by all of the companies. This was calculated as the sum of the costs of safety and quality [which included costs of all wastes, reworks, delays, appraisal costs, accidents, and general administration time wastage/delay, materials wastage, theft, accident, vandalism, mistakes, poor workmanship (construction), interest lost, delayed payment (maintenance period),

failure to maximise value (surveying); and replacement of damaged items, poor quality paperwork].

In company A, according to the projects undertaken during the year 1990, 21 per cent of turnover was accounted for by the cost of quality. During the next consequtive years, the exact figure of the cost of quality was not readily available, however, it was reported that they reduced. In company B, according to the projects undertaken for the year 1996, the cost of quality was estaimated 13.9 per cent of annual trunover. It has been reported to decrease constantly since the implementation of TQM and empowerment. For company C, in 1995, the cost of quality of the company's business was 6.7 per cent of annual turnover.

8.8 Conclusions drawn from the case study analysis

The prime aim of the research; the development of an empowerment implementation model, has been achieved by a careful analysis of the three case study companies. The model will assist in the selection and/or formulation of the most effective implementation approach for a construction organisation. The generic model shows clearly the elements of empowerment and methods of implementation. The model provides the user with a comprehensive database of information. It is left to the user to tailor a plan to the needs of the organisation. In general, the following conclusions were drawn from the analysis of case studies and subsequent development of a generic model.

- As discussed in Chapter Four, the case study analysis was conducted to investigate replications of implementation approaches within the three cases. This 'replication' strategy was used for 'corroboration' (i.e. a logical consistancy) amongst the three cases. Table 8.5 briefly illustrates the major empowerment processes and respective

employee involvement adopted in the three case companies. Except two processes (i.e. 'diagnose organisational capabilities' and 'establish personnel development folder'), almost all of the processes have been consistantly used across all of the three companies. Section 8.6 discussed in detail the logical consistencies in implementation approaches across the three companies. This indicates that the final generic model and the best practice framework have achieved external validity (see Chapter Four, Section 4.3.3.7 for external validity). That is, the research, in general, observed a similar pattern of major events of empowerment implementation across different settings. This ensured the reliability of the model, and that the model can be implemented in other companies having similar characteristics of companies A, B, and C. This is stage-one of external validity. Stage-two external validity was performed by obtaining industry feedback (feasibility study) on the generic model, which is presented in Chapter Nine.

- One of the important characteristics of the generic DFD model produced in this research is that it provided the self-efficacy information to employees, which included all of the four varieties: enactive attainment; vicarious experience; verbal persuasion; and emotional arousal (see Chapter Three, Section 3.4 for self-efficacy information). The self-efficacy information of the generic model is described in detail in the next chapter. Similar types of research (e.g. Burati et al, 1993; Mann, 1992), in the development of a TQM implementation framework for construction and manufacturing organisations, did not provide such information for the implementation of TQM.
- All of the three companies have already been exercising TQM before the implementation of empowerment. All have reported that prior experience in TQM has enhanced the empowerment process (and provided an environment) to be easily adoptable within their organisation.

- Since all of the companies have already gone through some kind of teamwork and participative management (within the TQM setting) by continuously restructuring their organisations, empowerment was introduced without much change in the organisational strucuture. Thus, a dramatic rearrangement of their organisations conducive for the empowerment implementation was not necessary.
- The best practice framework, including best practices for each of the three phases of the implementation, should be seen as an abstract of the generic DFD model. The best practices were used as key constructs to evaluate (the feasibility of) the generic model (see stage-two external validation, Chapter Nine).
- The internal validation of the model that finding triangulation of, or convergence among different sources of information is discussed in next chapter.

Chapter Nine

Validation and Evaluation of the Generic Model

9.1 Introduction

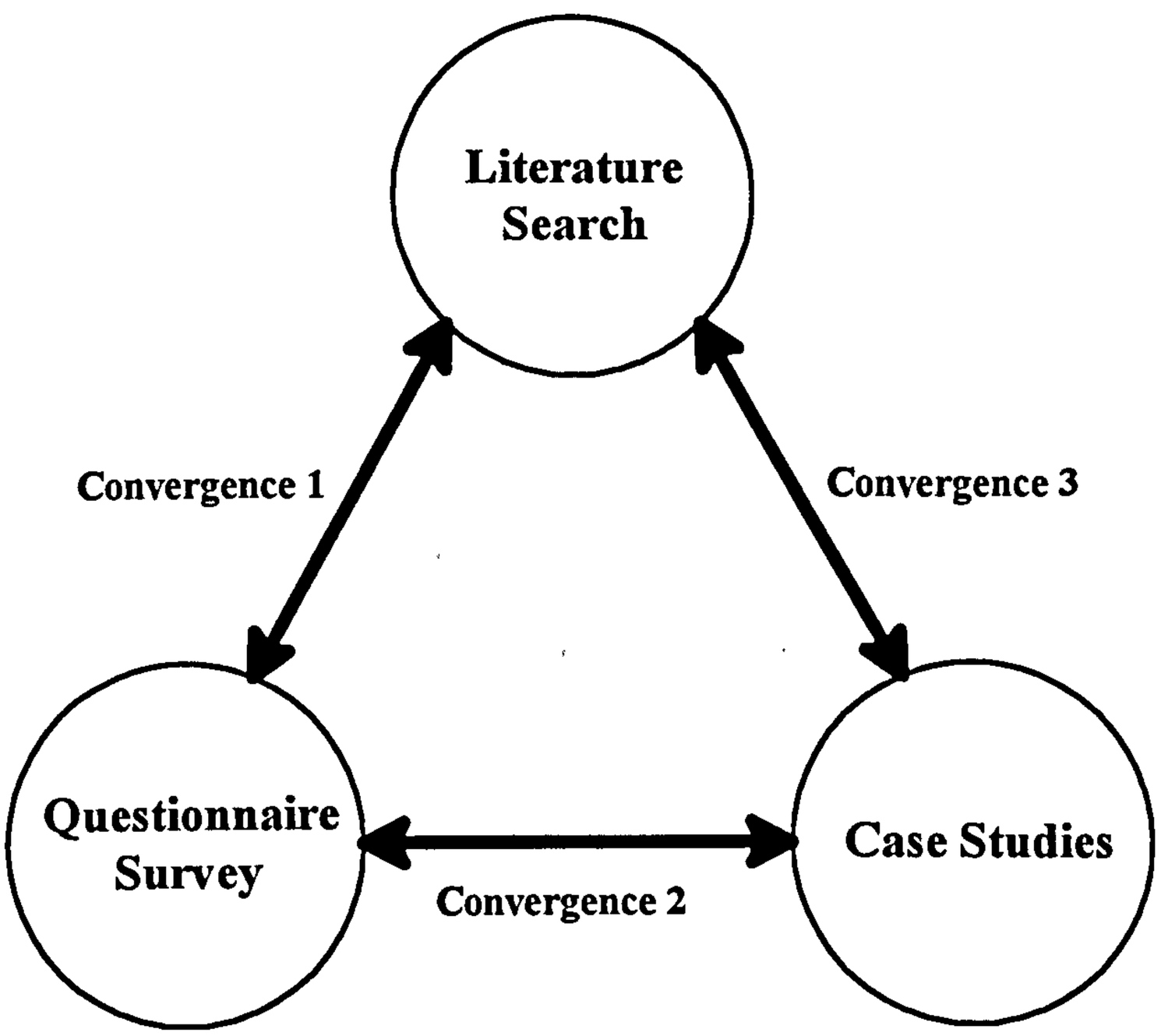
As was outlined in Chapter Four, this research validated the generic model in two dimensions. These were: 1) internal validation - finding triangulation of, or convergence among, three main sources of information (i.e., literature search, questionnaire survey, case studies); and 2) external validation. The external validation in itself focused on two perspectives. First, reliability of the model was examined by finding replications of events occurring in three different settings (case studies A, B, and C); and second, industry feedback (expert opinion) was sought on the feasibility of the generic model. The first perspective (i.e. reliability) of external validity has already been analysed and discussed in Chapter Eight, which concluded that the model was reliable (because a similar general pattern of implementation was replicated across the three different case-study companies). This chapter discusses both internal validation and the second perspective of external validation, i.e. expert opinion on the feasibility of the generic model.

9.2 Internal validation

The internal validation deals with convergence of findings that appeared among the three major investigations of the research: *literature search; questionnaire survey; and case studies*. Figure 9.1 illustrates the methodology of internal validation adopted in this research, depicting convergence links between the three major investigations. Link-one explores convergence of observations (findings) between the 'literature search' and 'questionnaire survey'. Link-two explores convergence of observations between

'questionnaire survey' and 'case study' investigations. Link-three explores convergence between the 'case studies' and 'literature search'. Each of these three convergence are now discussed in more detail in the following sections.

Figure 9.1. Internal validation methodology



9.2.1 Convergence 1: literature search and the questionnaire survey

Initially, the literature search identified nine major elements (i.e., leadership, empowerment system, resources development, involvement, education and training, teamwork, process improvement, measurement, and recognition) of empowerment implementation (Chapter Three), and groups of empowerment activities (sixty-two activities) attributed to these nine major elements (Chapter Five). Having obtained these initial findings, a questionnaire survey was conducted amongst both construction and manufacturing sectors to: assess perceptions of both construction and manufacturing sectors on the said empowerment

activities; identify the extent of use of each activity in both manufacturing and construction sectors; and assess the degree of organisational involvement (at four hierarchical levels) in performing those activities. Chapter Six presented the findings of the questionnaire survey.

Analysis of both perceptions and usage of the empowerment activities amongst both construction and manufacturing sectors indicated that sixty-one out of the original sixty-two activities were critical to the successful implementation of empowerment. This confirmed that the empowerment activities, as identified by the literature search, were empirically valid to be used as constructs for further detailed investigations (case studies).

Rankings of the nine major empowerment *elements* indicated that leadership and teamwork are most important, followed by resources development, involvement, process improvement, recognition, education and training then measurement and, empowerment system. This coincides with the literature in that top management's commitment and involvement is crucial in the process of enhancing feelings of self-efficacy among organisational members. Such commitment includes: senior management constantly encouraging employees in their job; providing the necessary funds and appropriate working conditions for employees; and providing an environment within which employees can work as teams [see Chapter Three and Chapter Five, sections 5.2, 5.3, 5.4, and 5.5]. This coincidence (between literature search and survey results) also supports the formal definition of empowerment adopted within this research that: *empowerment is not only encouraging employees to participate in decision making and delegating them the authority to be responsible for their own processes, but also (mainly) enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and informal techniques of providing efficacy information* (see Chapter Three).

Analysis of organisational involvement in performing the empowerment activities indicated that employees at higher levels of an organisation (i.e., four descending levels of organisational structure viz: strategic, general, operational, and direct work) have a greater role in implementing empowerment than employees at the lowest (i.e. direct work level). This further supports the above point that employees at higher levels must take all necessary actions to enhance feelings of self-efficacy among employees at lower levels.

Analysis of organisational involvement (Chapter Six, Section 6.5.5) also supported the literature (Chapter Five) in that the activities of 'leadership', 'resource development', and 'empowerment system' require involvement in the descending order of: strategic-general-operational-direct work. Both 'teamwork' and 'process improvement' receive the following order of involvement: operational-direct work-general. These results indicated that activities associated with provision of a suitable environment for the implementation of empowerment, including strategic directions (vision), required resources, and appropriate policy and system are largely the domain of top management (i.e. it is a top-down process). In contrast, activities associated with day-to-day business processes such as 'process improvement' and 'teamwork' are the areas of employees at lower levels (i.e. a bottom-up process). Analysis of case histories of companies shown in Table 5.1 (Chapter Five) indicated a similar pattern of involvement. On the other hand, all levels of the organisation have some involvement in all of the activities (see Figure 6.6, Chapter Six). This ensures that all employees in one way or another are involved in the improvement of all of the activities. Such involvement may be in the form of 'main actors', 'helpers', or 'participants'. To support this, for instance, the literature search (Section 5.2, Chapter Five) suggested that employees at all levels of an organisation act as leaders in visualising the future needs that satisfy customers (internal and external) and make logical decisions on their own business operations.

In essence, there has been an obsolute convergence of observations obtained from both the literature search and the questionnaire survey.

9.2.2 Convergence 2: questionnaire survey and case studies

Having confirmed the prudent empowerment activities and respective involvement of employees through questionnaire survey, further investigations were performed as to how the activities were practically dealt with, within empowered organisations (case studies). To assess whether the empowerment activities (Figure 6.1 - empowerment activity model, Chapter Six) had significant place in the real implementation of empowerment, Figures 6.1, 6.6, and 6.7 (activity model and involvement chart) in Chapter Six were compared with the generic model (Figures 8.35 to 8.45).

It is clearly evident from the generic model that most of the identified empowerment activities become crucial at some stage in the implementation process. For instance, the leadership activities (including facilitation, encouragement, management commitment, role model, vision/mission, and champions of empowerment) are followed at all levels of the organisation. Senior management first establishes company level vision and mission for the entire organisation to adopt. Then, it continuously shows its commitment by: providing necessary resources as and when required; assessing and improving employee attitudes; and, encouraging and facilitating employees, departments, and/or task teams to improve their business performance. Supervisors and managers act as partners and collaborate with subordinates (by participating in their processes) for improvements including, facilitating them in problem solving and team working. On the other hand, empowered employees act as leaders themselves in producing their self-vision for both improving their processes and skills. Similarly, most of the other activities attributed to the other elements such as teamwork, resources development, involvement, process

improvement, recognition, education and training, measurement, and empowerment system all have become critical components of the generic model (see the generic model, Chapter Eight).

To assess the hierarchical (organisational) involvement in the implementation of empowerment, Figures 6.6 and 6.7 (hierarchical involvement charts) were compared against the generic flow chart models (Figures 8.37, 8.40, and 8.45). In contrast to the four levels of an organisation (strategic, general, operational, direct work) proposed from the literature search, only three levels were actually identified within the case studies. Since all of the three organisations have flattened their organisational structure, there was no evidence of four levels in the functional hierarchy. This was mainly because of close team working between the company board and other general management, including personnel and finance. Therefore, the four levels can be consolidated into three as follows: the strategic and general levels comprise company Board and other management functions (such as personnel and finance); the operational level being the middle management (operational units); and individuals (employees) directly dealing with business including the direct work (staff working at site). This is because none of the three companies (case studies) had significant number of directly employed operatives at the sites during the time analysis was performed. As regards to these 'equivalents', both the hierarchical involvement chart and the generic flow chart model were compared. A similar pattern of involvement can be observed from these comparisons. For instance, the relative hierarchical involvement chart (Figure 6.7) showed that strategic and general level have played key roles in the areas of 'leadership', 'resources development', 'empowerment system', and 'education and training' activities. A similar involvement can be observed in the generic model. For instance, the Company Board (strategic) establishes company's vision (leadership activity), and accordingly develop suitable policy, roles, and plans (empowerment system activities) (see Figure 8.37). In all of these activities, participation

by both the middle management and employees are made for improvements. It can be seen from Figure 8.40 (flow chart of implementation phase) that first, the Company Board takes responsibility for initial training (including training on principles of empowerment and teamwork and problem solving techniques), then the personnel department become responsible for offering training to employees. This pattern of involvement has already been observed in the survey analysis (see Figure 6.7).

The hierarchical involvement chart indicated that process improvement and performance measurement, in an empowered organisation, is largely vested with employees at lowered levels of the organisation. To confirm this, the generic model (Figure 8.45) shows that during the sustaining phase, individuals, teams or departments are empowered to take decisions themselves at their own levels for improving both their processes and performance. Empowered individuals develop their own self-vision, which subsequently leads them to both develop action plans (proposals) for improvements in their processes and identify any deficiencies in their skills to perform their processes efficiently. Implemented solutions and/or effects of improved skills are finally measured. In all of these activities they closely work with their supervisors or partners. Regarding 'measurement', all levels are involved in measuring their performance. However, company wide business performance, according to the 'hierarchical involvement chart', is measured by operational, general, and strategic levels. Consistently, the generic model (Figure 8.45) shows that both the Company Board and middle management are involved in measuring company level business performance. Individuals' self (performance) assessments, and data from both the personnel and finance departments, are used to help calculate company overall performance.

9.2.3 Convergence 3: case studies and the literature search

Here, there were several conclusions drawn with regard to the concept of modern empowerment. Some of the key conclusions are discussed in this section, along with their reference to the developed generic model.

Propositions Vs Generic models

The concept of empowerment was defined in Chapter Three as: "a process of enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and informal techniques of providing efficacy information". The conditions that both foster powerlessness and their subsequent removal, and enhance self-efficacy among employees were identified from the literature and proposed as nine major elements for the implementation of empowerment. Each of the original propositions are compared with the generic model as below:

- *Proposition 1: Managers and supervisors act as leaders. The leadership exists at all levels of the organisation, including within every empowered employee.* It can be seen from the generic model (Figure 8.35) that senior management acts as leaders by: establishing future vision and suitable policy and plans for achieving the vision; and providing a suitable environment (all i.e. necessary resources including fund and working conditions). Figure 8.43 illustrates that leadership exists at all levels of the organisation. For instance, traditional supervisors or managers deviate from some of their conventional practices such as inspection, and act as leaders or partners in co-operating with their subordinates for business improvements. It can also be seen from the model that every empowered individual themselves act as leaders in producing self-vision for both self development and process improvements. These evidences suggest

that there has been a strong convergence between the literature and case studies on proposal 1.

- *Proposition 2: A system, inherently possessing appropriate policy, procedures and plans, facilitates effective implementation of empowerment throughout the organisation.* The preparation phase of the generic model (Figure 8.35) confirms this proposition. Senior management (Company Board) is involved in producing appropriate policy and plans including procedures and roles prior to the actual implementation. Thus, an overall system is produced in advance to implementing empowerment throughout the organisation.

- *Proposition 3: Resources (such as fund, equipment, working conditions etc.) are provided to or accessible by employees to support the empowerment process.* Figure 8.36 illustrates in detail how both the management and employees are involved in developing resources. This becomes an ongoing process continuously performed by these same parties. Employees are empowered to report to management for any new resources, accordingly, management takes immediate actions to provide them.

- *Proposition 4: All individuals or teams are involved in the process of empowerment with common objectives.* It can be seen in all three phases of implementation (Figures 8.35, 8.38 and 8.41) that gradually, all employees are encouraged (voluntary participation) to be involved in the empowerment process. Once the induction workshops are completed, employees are encouraged to decide on involving in empowerment (see Figure 8.38). Their focus is concentrated on achieving the company wide vision.

- *Proposition 5: Employees at all levels of the organisation are continuously trained on technical, group dynamics, problem solving, and decision making skills to manage their own processes.* Figure 8.39 shows the process of continuous training, where employees jointly cooperate with their supervisors or managers and identify their training needs. With the assistance of the Personnel department, they receive continuous training. Finally, sufficiently trained employees are authorised to act as empowered individuals.

- *Proposition 6: Employees are let to control their own processes, where individuals focus on continuously improving their business related processes.* The self management system (Figure 8.43) illustrates that empowered individuals completely own control over their processes by having freedom to: implement any changes or improvements within their processes; select suitable partners who they feel appropriate to assist or advise on their performance; and measure their own performance.

- *Proposition 7: Teams of different kinds (e.g. delegated teams, cross functional teams, self-managed teams) are established at various levels of the organisation.* Teamwork, between management (senior and middle) in establishing vision, policies and plans in the earlier stage of implementation, and in producing group level improvement plans and group level performance measurements at later stage (sustaining), are very evident. A similar kind of teamwork also exists at lower levels, i.e. between partners and empowered individuals. Delegated teams are also established at both senior and middle levels to solve company level problems.

- *Proposition 8: Everyone involved in empowerment measures and records its effects, including successes and failures, for further improvement.* It can be seen in the sustaining phase (Figure 8.41) that both management and employees measure their

implementation efforts. Senior management measures company level performance including financial performance, employee attitudes, and benchmarking with competitors. Individual employees measure their performance with respect to their own processes.

- *Proposition 9: Recognition of achievements of both individuals and teams or departments motivates them to perform at highest standards.* It can be seen that both middle and senior management and partners or supervisors, recognise the achievements of individuals. There are several ways to recognise accomplishments, one of the most notable stemming from case study analysis being that accomplishers were honoured in a ceremony and awarded gifts.

Participation, delegation and the generic model

Chapter Three concluded that both 'participation in decision making' and 'delegation' are crucial for the effective implementation of empowerment. To support this argument, all phases of the generic model indicates that these two styles are inevitable in the process. It can be seen from the preparation phase (Figure 8.35) that employees are encouraged to participate in strategic level decisions made by senior management including, development of vision, policies, and plan. Employees also participate in resource allocations. In the later stage (sustaining phase, Figure 8.41) of implementation, they are delegated the authority to control their own processes and take relevant decisions for improvements (Figure 8.43). This supports the argument that both participation and delegation are essential for empowerment.

9.2.4 Conclusions drawn from the internal validation

The above sections contrasted results of all of the three major investigations (literature search, questionnaire survey, and case studies) adopted in this research, with a view of identifying convergence of observations obtained amongst these three investigations. The discussions have proved that there have been several convergences amongst these investigations to internally validate the generic model. Some of the key converging points are as follows:

- The (sixty-two) empowerment activities identified from the literature review were perceived as very important from the questionnaire survey analysis, and subsequently, the development of a generic model (analysis of case studies) confirmed them as crucial in the actual implementation of empowerment.

- The pattern of organisational involvement in the implementation process of empowerment as developed from the questionnaire survey, was replicated in the actual implementation (Generic model). This was also supported by the literature search, where the practices of companies listed in Table 5.1 (Chapter Five) showed a similar involvement.

- The nine major propositions (based on literature review) initially made in this research, have been confirmed by the generic model.

- The conceptual confusion regarding 'participation' and 'delegation' in empowerment implementation, as existed in the literature, was initially resolved in Chapter Three as both are important for the implementation of empowerment. This argument was further proved as true in the actual implementation (generic model).

In essence, the theory of 'triangulation' applied to the three major investigations of this research (literature search, questionnaire survey, and case studies) has internally, validated the generic model.

9.3 External validation

Checkland (1981) argued that within the context of soft systems models, that there are not valid and invalid models, only defensible models and ones which are less defensible. In evaluating system models for their defensiveness, several techniques have been used by Checkland (1981) and Checkland and Scholes (1990). All of those techniques concentrate on a single strategy, i.e. comparing newly developed systems with that of the real world to assess the possible changes that are postulated, should be introduced. However, the important aspect of the comparison strategy adopted by Checkland is that it is focused towards solving a particular problem within an individual organisation. That is, first, the problem within an individual company is identified. To solve that problem, a conceptual system model is developed. Finally, the model is compared with the real problem situation to identify and evaluate possible 'changes' to be introduced within that organisation. A similar strategy has been adopted in a 'hard systems' approach, where the system was evaluated against the objectives set by management and subsequently recommended for implementation (Lee, 1984; Kendall and Kendall, 1992; Skidmore, 1994). The evaluation, in hard system approach, was to study the feasibility of the system in terms of three perspectives: technical; operational; and economical. The objectives of the feasibility study are to: assess whether there are good technical, social and economical reasons for changing to a new system; and ensure that any new system which is developed will be acceptable to users, flexible in a situation of change and reasonably robust.

The main difference in the evaluation process between 'soft' and 'hard' systems is the objective of the evaluation itself. In a soft systems approach, the system is evaluated for being able to solve an ill-structured problems (like; what is the reason for frequent occurrence of accidents?); the resultants of the evaluation will highlight the more modest changes that are required to solve the problem. Where as, in hard systems, the system is evaluated for its implementation; whether the outline system is technically sensible and viable, socially acceptable, and economically beneficial.

Although, the comparison strategy is methodologically valid for evaluating systems models, it cannot be readily adopted (in the same format as it was adopted in the literature) in this research, because, this research was not directed to investigate one particular problem within one *individual organisation.* Rather, the objective of this research was primarily to develop an effective implementation strategy for implementing empowerment in construction organisations. Accordingly, it produced a generic DFD model for implementing empowerment, based on three case studies. The 'change' envisaged in this research is the implementation of the generic DFD model in construction organisations, in general, but not in a particular individual organisation. In this case, all aspects of the three feasibility perspectives (i.e. technical, operational and economical) can not be investigated in detail. For instance, the technical feasibility, includes investigation of current procedures in order to identify the volumes, trends, frequencies and cycles of activities that will specifically affect a new system. Detailed exploration of these areas is only possible when this study (the research) is entirely focused on implementing empowerment in a particular individual organisation. In contrast, the study was focused on industry wide application of empowerment. Consequently, three samples (cases) were studied and a generic model produced. Within certain constraints, the study further intended to evaluate the feasibility of the model for industry wide application. In this situation, instead of a detailed investigation (on one particular company), the study

preferred expert opinions (from several companies) on the feasibility (technical, operational, and economical) of the model. However, the core theme of the evaluation, i.e. the comparison strategy, is strictly adhered to seeking feedback on the model from experts.

Feasibility aspects

There are no specific sets of feasibility criteria prescribed in the literature to evaluate a particular system. Lee (1984) argued that identification of feasibility criteria largely rests with the analyst. The analyst is controlled by various elements in selecting the criteria; these include the nature of the problem, the characteristics of the particular organisation on which the new system will be imposed, availability of technical facilities to implement the system, operational and functional systems of the organisation and so on. Broadly, three major feasibility aspects were encountered in several literature (Lee, 1984; Kendall and Kendall, 1992; Skidmore, 1994). They are: technical aspects; operational aspects; and economical aspects).

The technical aspect is concerned with evaluating facilities and methods that will support the required system. This include: evaluation of users' acceptability on various proposals of the new system that deal with output reports, files, input methods and programme requirements; evaluation of the need for specialist equipment or extra storage; and evaluation of communication facilities required for the new system.

The operational aspect is largely concerned with the attitude of staff to the proposed change and the likely impact of the various alternatives on their jobs. It includes: evaluation of significant changes in the work situation of staff; changes in relationships among staff; changes in organisational structure and procedures; and changes in staff responsibilities.

The economic aspect is concerned with assessing costs of proposed changes. It is comparing the costs of doing things in a particular way to the benefits, which also includes assessment of the financial returns that hopefully outweigh the costs. Specifically, the economic aspect includes: the cost of development and conversion such as computer staff time, user involvement time, education and training, management and equipment and software acquisition; technical costs including volume of data, frequency of processing, cycle of activity, and location of operating units.

Proposal document for expert evaluation

In line with the above aspects, a proposal document, comprising a description of the generic model, and proposals (sought by the generic model) for implementation, along with relevant feasibility criteria, was developed (see Appendix E) This was supplied to experts for their evaluation. This validation proposal document was developed in strict accordance with the guidelines suggested by Kendall and Kendall (1992). They suggested that the system proposal document should comprise ten main sections: 1) cover letter; 2) title page of project; 3) table of contents; 4) executive summary; 5) outline of systems study with appropriate documentation;, 6) detailed results of systems study; 7) systems alternatives; 8) systems analysts' recommendations; 9) summary; 10) appendices. It was on these comprehensive guidelines the proposal document was prepared (see Appendix E). The contents were as follows: title of the project; table of contents; introduction of the project subject; outline of the study; results of the study with recommendations (proposals), accompanied with relevant evaluation (feasibility) criteria; and appendix.

9.3.1 Companies participating in the feasibility study

The proposal documents were sent to the named respondents of companies (seventeen in total, including case study companies) who, had earlier (during questionnaire survey stage)

reported their interest in participating in future aspects of this research. Since the generic model was the combination of best practices of all three case study companies, their inclusion in the validation phase was important to adjudicate on the generic model (which is different from their current system). Out of the seventeen companies contacted, seven of the original participants had left their companies, one had transferred to an overseas branch at New Zealand and two were on holidays. Therefore, only seven were available for this validation study. Characteristics of these companies are exhibited in Table 9.1. It can be seen that the annual turnovers of these companies varies from between £40m to £1800m. Similarly, their total employee sizes vary between 200 and 10, 000. In the case of direct labour employment, case companies A, B, and C appoint only a negligible number of direct labour, where as companies D, E, F, and G appoint a significant number of direct labour. All companies (except G) have nation-wide (UK) regional offices, whilst only companies A, D, and E also operate abroad. Company G operates only in Scotland. This indicates that thel companies are diversified in terms of size and locations. Other similarities include their involvement in construction projects and empowerment implementation. Their construction activities are limited to civil engineering and building projects. Also, six out of seven companies are involved in empowerment. Results of their evaluation on the generic model are discussed in following sections.

Table 9.1. Characteristics of companies participating in the feasibility study

Company	Annual turnover (£M)	Employee size	Direct labour employment	Regional offices location	Type of project involved	Empowerm-ent involvement
A	300	2000	Negligible amount	National and international	Civil and Building	Yes
B	400	1200	Negligible amount	National level	Civil and Building	Yes
C	75	400	Negligible amount	National level	Building	Yes
D	1800	10000	Yes	National and international	Civil Engineering	Yes
E	150	3000	yes	Internationa l	Civil and Building	Yes
F	50	600	yes	National level	Building	No
G	40	200	Yes	Scotland	Building	Yes

9.3.2 Feasibility of the preparation phase

In the preparation phase, company's future directions and goals are established, and subsequently necessary resources required for the achievement of those goals are established. This includes four key tasks: development of company level vision; development of appropriate quality and empowerment policies' development of implementation plans; and development of appropriate resources including fund, suitable organisational structure, and so on. It can be seen from the generic model that these tasks seek: senior management involvement and commitment; participation in decision making (e.g. decision making in vision development, resource development) by lower level employees; and teamwork between senior management and middle management. Feasibility of these tasks (see the generic model and the best practice framework for

detailed tasks) were assessed in terms of: changes in the role of participants that are envisaged by these tasks; impact of participation of lower level employees in decision making; communication problems that might hinder team working; and amount of paperwork and excess manpower that might involve during the preparation phase. Evaluation of these criteria by participating companies are collectively reported in Table 9.2, which is discussed below under respective criteria.

Senior management involvement

It can be seen from the table that all companies except one have foreseen radical changes in the role of senior management and considered senior management involvement critical in the implementation of empowerment. Three companies (one case study company and two non-case study companies) felt that senior management's role during the preparation phase would be burdensome. In the case of 'time availability for senior management to involve in the preparation phase's tasks companies have divided opinions. All case study companies and one non-case study company stated that time is available for senior management to play an active role in the preparation phase. In contrast, three non-case companies stated that time is not available. However, both commented that senior management involvement is essential, without which change would not happen. For instance, companies A and C commented that: *"companies should see this (principles and tasks involved in the preparation phase) as an opportunity for improvement and therefore time should be made available"*. A non-case company (company E) commented that: *"involvement of senior management was essential, irrespective of time, and that the overriding priority was top management involvement"*.

Table 9.2. Feasibility of the preparation phase

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Senior management involvement in the preparation phase							
Seeks radical changes in the role		■	■	■	■	■	■
Burdensome for senior management		■		■		■	
Senior management involvement is critical	■	■	■	■	■	■	■
Time is available for senior management	■	■	■				■
Participation by middle management & employees							
Offer early awareness to employees on policies	■	■	■		■	■	
Advantage of having inputs from employees	■	■	■	■	■	■	■
Teamwork between senior management and middle management							
Communication will be an impediment		■	■	■	■	■	
Provision of communication facilities will be costly		■			■		
Costly, but has long term benefits		■	■		■		
Consulting mechanism will incur high cost & time				■	■	■	
Paperwork							
Involves more paperwork							
More paperwork, but necessary							
Not much paperwork, avoided by informal ways	■	■	■	■	■	■	■
Manpower requirement							
Preparation phase requires:							
extra manpower				■			
current staff is enough		■	■	■	■	■	■
staff re deployment		■		■	■	■	
external appointment (consultants)	■				■		

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

Participation in decision making

All companies except two stated that employees' participation (in decision making) at the early stage of implementation, enables employees to be aware of the company's future goals, policies, and plans. In addition, all companies stated that this participation has the advantage of having inputs from all levels of the organisation. In this regard, company G

has quoted that: *"this participation should be in limited areas, otherwise it could turn into unproductive".*

Teamwork

As mentioned earlier, both senior and middle management work closely in developing vision, policies, and implementation plans. In this case, most of the companies stated that communication between senior and middle management would be a problem. However, most of them agreed that communication facilities would not be costly (only two companies commented to the contrary). Two case companies and one non-case company stated that provision of such facilities would have long term benefits. Case companies and non-case companies were divided in their opinion in terms of 'consulting mechanism'. In contrast to the case companies, non-case companies stated that consulting mechanisms between senior and middle management would incur high cost and time.

Paperwork

All companies agreed that the preparation phase tasks would not require much paperwork, and that it could be avoided by informal means of working (see Table 9.2).

Manpower requirement

Most of the companies stated that the preparation phase would not require extra manpower, and that current staff can be tackled efficiently to address any extra needs. However, two companies suggested the appointment of external staff (consultants). Three non-case companies and one case company stated that the preparation phase would require staff re-deployment. This indicates that companies may need to reengineer their organisation (at the early stage of the preparation phase) if their structures are not conducive to undertaking preparation phase's tasks.

9.3.3 Feasibility of the implementation phase

During the implementation phase, suitable strategies are adopted to involve employees in the change process, and make them continuously acquire sufficient skills and knowledge to act as empowered employees. These include: initial training to make employees aware on empowerment and related principles, and training them on problem solving techniques and teamwork principles; encourage employees to voluntarily be involved in the change process; continuously train and educate employees regarding their business related activities; continuously assess employee attitudes including satisfaction and grievances towards change; solve their grievances once they are perceived. It can be seen that the implementation phase seeks full commitment and involvement by both senior and middle management in providing a suitable environment (including training and resources) for employees to adopt empowerment. In essence, this phase includes four major areas: initial training and involvement; a continuous training system; attitude measurement, and grievance solving (see the generic model). Each of these areas were evaluated for their respective sub-systems in terms of relevant feasibility criteria (see Table 9.3, 9.4, 9.5), and their results are discussed in the following sections.

9.3.3.1 Feasibility of 'Initial training and involvement' sub-system (Implementation phase

Senior management training

The model suggested senior management training on empowerment related issues before actual implementation. All companies evaluated this as being very important, and stated that they could find time to undergo training (see Table 9.3).

Table 9.3. Feasibility of 'Initial training and involvement ' sub-system (Implementation phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Senior management receives training on empowerment relates issues							
Senior managment training is:							
important	■	■	■	■	■		■
less important							
not at all important							
Senior management:							
could find time to undergo training	■	■	■	■	■	■	■
could hardly find time for training							
Senior management conducts a series of training workshops							
Will affect senior management's day-to-day jobs				■	■	■	
Locations of regional units will be a problem	■				■	■	
Location problems can be overcome	■	■	■	■	■	■	■
Voluntary participation							
Encourages employees to adopt empowerment	■	■	■		■	■	■
Takes long time for employee involvement	■		■	■	■		
Senior management commitment enables quick involvement	■	■	■		■	■	■
Establishment of Personnel Development Folders							
Radically change the current role of supervisors, so impractical					■		
Seek only minor changes, so feasible	■		■	■		■	■
Would not make any difference from current practice				■			
Involves much paperwork							
Does not involve much paperwork	■	■	■	■		■	■
A costly exercise	■		■		■		
Costly, but important	■	■	■		■		
Not costly, compared to current practice				■		■	■

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

Training workshops

After receiving training, senior management conducts a series of workshops to train lower level employees. Respondents were asked whether: it would affect senior management's

day-to-day business; and whether locations of regional units would cause problems to conduct training workshops. Regarding the first criteria, companies (case study and non-case study companies) have contrasting opinions; case companies stated that it would not affect senior management's job, and non-case companies stated that it would affect their jobs. Regarding the second criteria (locations of regional units), all companies agreed that problems contributed by diversed locations of regional units can be overcome. Although, only two non-case companies and one case company have stated that locations can cause problems in conducting workshops. In particular, one non-case company commented that: *"if it was a problem, then your business was wrongly focused"*.

Voluntary participation

Regarding voluntary participation, six out of seven companies stated that it would encourage employees to adopt empowerment, and that senior management commitment would enable quick involvement. Only four companies stated that it would take long time for employees to become involved (through a voluntary scheme) in the absence of senior management's commitment.

Establishment of Personnel Development Folders

The model suggested establishment of Personnel Development Folders for each employee by their supervisors to continuously track skill developments. Out of seven, five companies stated that it would make only minor changes to the current role of supervisors, whilst one mentioned that it would seek radical changes. One stated that this was not different from current practice. Almost all, mentioned that it would not involve much paperwork. Four stated that it is a costly exercise, but all the same, it is important to track employees' skills. Three mentioned that it is not costly compared to current practice (Table 9.3).

9.3.3.2 Feasibility of the 'Training system' sub-system (Implementation phase)

The training system (see generic model) was evaluated in terms of three major criteria: job changes sought by the system; cost involved in implementing the system; and benefits (see Table 9.4).

Table 9.4. Feasibility of 'Training system' sub-system (Implementation phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Job change							
The training system :							
seeks radical change change in the current role					■	■	
seeks only minor changes	■	■	■				■
would not seek any changes				■			
Cost							
The training system is:							
costly and time consuming, impractical							
costly and time consuming, but necessary	■		■			■	
not much costly and time consuming		■		■	■		■
Benefits							
The training system would improve activity based training and multidisciplinary skills							
yes	■	■		■	■	■	■
no			■				
not certain							
The training system would achieve:							
radical improvement in employee training	■	■	■		■	■	
moderate improvement in employee training				■			■
not significant improvement							

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

Job changes

There were divided opinions on 'job changes' between case and non-case companies; case companies stated that the training system would not require any radical changes in the current role, and anticipated only minor changes, whilst amongst non-case companies, one

said it would not seek any changes at all. Two stated that radical changes are unavoidable (see Table 9.4). In essence, the majority of companies anticipated no radical changes in implementing the training system.

Cost and time

Regarding cost and time required for implementation, companies had a balanced opinion; three stated that the system is costly and time consuming (but necessary for empowerment), and four maintained that it is not very costly or time consuming.

Benefits

There was strong agreement amongst companies that the training system would improve activity based training and offer multidisciplinary skills. In addition most of them agreed that the system would radically improve employee training (see Table 9.4).

9.3.3.3 Feasibility of 'Attitude measurement and Grievances solving' sub-systems (implementation phase)

It can be seen from the model that management continuously assesses employee attitudes including their satisfaction and grievances towards or about change. This may consume a considerable amount of management's time, but might result in other improved benefits. Using these criteria, respondents were asked to evaluate the 'attitudes measurement and grievances solving' system (see Table 9.5). Four companies stated that it does require much time for management to perform. Two said it is time consuming, but essential for effectively implementing empowerment. Except company D, all stated that the grievances system would: enhance employee satisfaction; stimulate continuous improvement approach; and improve partnership between management and employees. In addition, company D quoted that: "*senior management attitudes should also be measured*".

Table 9.5. Feasibility of 'Attitudes measurement and Grievances solving' sub-systems (Implementation phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Time							
Time consuming for management:							
so impractical				▒			
but essential	▒		▒				
Not time consuming		▒			▒	▒	▒
Benefits							
The grievances system:							
enhances employee satisfaction	▒	▒	▒		▒	▒	
stimulate continuous improvement approach	▒	▒	▒		▒	▒	
improves partnership between management and employees	▒	▒	▒		▒	▒	▒

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

9.3.4 Feasibility of the sustaining phase

During the sustaining stage, sufficiently skilled employees act as empowered individuals. In addition to their own process level problems, they incorporate both company level problems and improvement plans at their business level and continuously strive for improvements in their processes. This includes continuous improvements in their skills by continuously identifying their deficiencies in business related skills, and subsequent learning. The effects of both learning and improvement efforts applied to the business are measured at all levels of the organisation. Continuously, best performers are recognised (see the generic model for details). Having these tasks identified for the sustaining phase, they were evaluated for their feasibility with respect to their impacts on current jobs and manpower requirements, communications, costs, skill improvements, superior/subordinate relationships, and employee attitudes. Tables 9.6 to 9.9 illustrate results of this analysis.

9.3.4.1 Feasibility of 'Process improvements by senior management' sub-system (sustaining phase)

This system deals with the role of senior management in identifying company level problems and accordingly producing improvement plans for employees to implement at their process level. This includes: regular contacts with external participants (customers and suppliers) for identifying problems; establishment of task teams to explore the cause of, and possible solutions for, problems; and middle management (and relevant employees') involvement in implementing the solutions (see the generic model for details). These tasks, collectively as a process improvement system, were evaluated: for their impact on job changes; communications problems that would be encountered (during implementation); additional cost and manpower that would be required for the implementation. Table 9.6 illustrates results of the analysis. Out of seven total companies, three said the system would seek moderate changes in the role of senior management, and two said no significant changes would be encountered. Regarding communications, four said it would not affect communications, and three stated that the communication problems can be overcome by IT or some other means. Regarding cost and manpower requirements all expressed similar views. The collective assessment is that the system would not require additional staff, and more importantly, it would incur less cost than current practice.

Table 9.6. Feasibility of 'Process improvements by senior management' sub-system (Sustaining phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Job changes							
Radical changes in the role of senior management		■				■	
Moderate change in the role of senior management	■		■	■			
No significant change					■		■
Communications							
Locations of operating units:							
would not affect communications		■		■		■	■
would affect communications							
can be overcome by IT or other means	■		■		■		
Cost							
A costly exercise							
Not costly compared to current practice	■		■	■	■	■	■
Costly, but important		■					
Manpower requirements							
Would require additional staff:							
so, impractical							
but essential to achieve customer satisfaction							
Does not require additional staff	■	■	■	■	■	■	■

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

9.3.4.2 Feasibility of 'Self management' sub-system (sustaining phase)

This is the critical part (sub-system) of the generic model, which details sustained involvement of empowered employees. This includes several activities: identification of partners to assist in improvement activities; establishment of self-vision (including problem identification and identification of skill deficiency); continuous self-managing training; development of improvement proposals (along with cost benefit analysis); and actual implementation of proposals (see the generic model for details). Since this sub-system deals with partnership between employees and seeks a dramatic change in employee

attitude, it was evaluated for five major criteria: job changes that the system would envisage; impact on superior/subordinate relationships; skill improvements; cost; and change of employee attitudes (see Table 9.7).

Table 9.7. Feasibility of 'Self management' sub-system (Sustaining phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Job changes							
Would require radical change, so impractical							
Would require radical change, but feasible	▒	▒	▒		▒	▒	▒
Would require moderate change, so impractical							
Would require moderate change, but feasible				▒			
Require no change in current practice							
Superior/subordinate relationships							
The partnership arrangement would:							
be difficult to implement, so impractical							
be difficult to implement, but important	▒		▒	▒		▒	
be implemented without much difficulty		▒			▒		▒
improve individual-supervisor relationship	▒	▒	▒		▒		▒
not improve individual-supervisor relationship							
Skills							
Employee skills to efficiently perform self-management system:							
be developed	▒	▒	▒	▒	▒	▒	▒
not be developed							
Current skills are sufficient							
Cost							
Self-management system would incur:							
high cost							
moderate cost	▒		▒	▒		▒	
not significant cost		▒			▒		▒
Attitude							
Changing staff attitude towards the self-management system is:							
impractical							
possible	▒	▒	▒	▒	▒	▒	▒
currently in practice		▒					

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

Almost all of the companies assessed that: the system would require radical but feasible changes; employees' skills to efficiently perform self-management tasks can be developed; and staff attitudes can easily be changed towards adopting the self-management system (Table 9.7).

Regarding the partnership arrangement, there are some conflicting opinions regarding its implementation. Four said it would be very important but difficult to implement. However, three stated that it could be implemented without much difficulty. The inference drawn from these statements is that depending upon companies' own characteristics, the partnership could be implemented easily or with some initial difficulties. Regardless of difficulties in practice, it should be implemented for efficiently managing self-developments. Regarding superior/subordinate relationships, a majority of the companies stated that it would improve their relationships. Regarding investments, four stated that the system would incur moderate cost whilst three stated that it would require significant investment. In particular, company D stated that: *"the system would incur cost far less than the savings, so insignificant"*.

9.3.4.3 Feasibility of 'Group level performance assessment' sub-system (sustaining phase)

Measures regarding individuals' performance, financial performance, attitudes and satisfaction surveys, and so on are periodically collected and assessed by the senior management. Results of these measures are benchmarked against identified business competitors through surveys, and finally, results are published. These tasks are likely to involve time and communication costs in collecting company level data, and involve a considerable amount of paperwork. These criteria were evaluated for their feasibility, and a summary of the assessment is reported in Table 9.8. Four of the companies (three case

companies) stated that company wide data collection is currently in existence whilst three said that company level data collection is possible and will present no major problems. Regarding cost and paperwork, four stated that the system would incur moderate cost and involve a moderate amount of paperwork. Three quoted that possible investment and paperwork would not exceed the current amount.

Table 9.8. Feasibility of 'Group level performance assessment' sub-system (Sustaining phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Data collection and analysis							
Company level data collection is:							
impractical							
possible				▒	▒	▒	
currently in practice	▒	▒	▒				▒
Cost							
Group level performance assessment would incur:							
high cost							
moderate cost		▒		▒	▒	▒	
not different from current cost	▒		▒				▒
Paperwork							
Paperwork cost would be:							
high							
moderate		▒	▒		▒	▒	
not different from current practice	▒			▒			▒

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

9.3.4.1 Feasibility of 'Award (recognition)' sub-system (sustaining phase)

The model suggested an unbiased award system to recognise achievements. The award includes cash or prize and dinners. Therefore, the award system was evaluated using two criteria: difficulty in maintaining an unbiased award system; and the cost of such a system.

Except two, all companies stated that maintenance of an unbiased award system is possible. Almost all of them stated that such system would not incur a significant amount of investment (see Table 9.9).

Table 9.9. Feasibility of 'Award (recognition)' sub-system (Sustaining phase)

Feasibility Criteria	Case Companies			Other Companies			
	A	B	C	D	E	F	G
Impractical to maintain an unbiased award system		■			■		
Possible to maintain an unbiased award system	■		■	■		■	■
The award system would incur:							
high investment							
moderate investment						■	
not significant investment	■	■	■	■	■		■

Note: Shaded boxes indicate experts' positive (yes) response against respective criteria

9.3.5 Conclusions drawn from the external validation

The above results of the feasibility study have demonstrated a converging opinion on feasibility of the generic model amongst those construction companies participating in the study. The feasibility study intended to test the model against the current organisational systems (and practices) of participating companies. Regardless of their varied nature (in respect of turnover, employee size and so on), all have evaluated the model as t*echnically*, *economically*, and *socially* feasible for implementing empowerment in construction organisations (see Table 9.1 for characteristics of participating companies). This indicates that the model, in principle, can be applicable to different types of construction organisations. The key conclusions drawn from the feasibility study are highlighted below.

Preparation phase

- The senior management involvement, as envisaged in the preparation phase, will seek a radical change in its current role. However, it is critical for effective implementation of empowerment. Time can be made available to involve in the empowerment process.
- Employees' participation (in decision making) at an early stage of implementation would enable them: to be aware of policies and implementation plans; and to offer operational level inputs for effective implementation.
- Communication (and consulting mechanism) between senior management and middle management could be a problem. However, provision of communication facilities would not be costly.
- The preparation phase would not require extra manpower, and the necessary duties can be tackled by existing staff. However, staff redeployment may be necessary to efficiently use the manpower.

Implementation phase

- Senior management training on empowerment related issues is essential at the early stage of the implementation phase. Senior management could find time to undergo this training.
- After receiving training, senior management conducts a series of workshops to train lower level employees. These workshops would not affect their (senior management) day-to-day jobs. Dispersed locations of regional offices can also be overcome in conducting the workshops.
- Voluntary participation (of employees) would encourage employees to adopt empowerment. Senior management commitment would also contribute to quick involvement.

- Establishment of Personnel Development Folders for employees would make some minor changes to the role of supervisors. This would not involve too much paperwork. However, based on the existing system, it may or may not incur cost.
- The 'training' sub-system: would not seek radical changes in the role of management and employees; would not incur significant investment and time; would improve activity based training and offer multidisciplinary skills; would radically improve employee training.
- 'Attitude measurement' and 'Grievances solving' sub-systems: would not require much time for the management to become involved; would enhance employee satisfaction; stimulate a continuous improvement approach; and improve partnership between management and employees.

Sustaining phase

- The process improvement activities (sustaining phase) would: seek moderate changes in the role of senior management; not affect communications (could be overcome by the use of IT or some other means); not require additional staff; and incur less cost than current practice.
- The 'self-management' sub system: may require radical changes in the current system, but be feasible to implement; and could be efficiently performed by improving employee's skills. Staff attitudes can be easily changed towards adopting the self-management system. The 'partnership' arrangement emphasised by the self-management system would improve relationships between superiors and subordinates.
- The 'Group level performance assessment' system should not have problems in collecting data at company level. The cost and paperwork associated with this exercise would be moderate.
- An unbiased 'award system' could be maintained without problems. It would not incur a significant amount of investment.

9.4 Summary

This chapter has validated the generic model in terms of its feasible application in construction organisations. The validation consisted two dimensions; *internal* validation and *external* validation. The internal validation sought to identify convergence amongst three major investigations of this research viz: literature search; questionnaire survey; and case studies. The initial findings observed from the literature search including, nine propositions, empowerment activities, and organisational involvement were subsequently confirmed by industry wide questionnaire survey and case studies. This validated the implementation approach (demonstrated by the generic model) developed from the case study investigations.

The external validation was focused in two dimensions: 1) finding replications of empowerment events occurring in three different case studies to test the reliability of the generic model; and 2) feasibility of the generic model by obtaining expert assessment from industry. The first dimension was discussed in Chapter Eight, and concluded that the model was reliable. This chapter has analysed in detail the feasibility of the model with the data provided by seven construction companies. Several feasibility criteria attributed to *technical, social*, and *economical* conditions of construction organisations were studied against the implementation of the generic model. The detailed assessment of these criteria by seven participating companies enabled suggestion that the model is technically, economically, and socially feasible to be applied to different types construction companies.

There has been an overwhelming response from the participating companies in favour of the model; it has been observed that the model would: radically improve training and employee skills; radically change the operating systems of construction organisations; reduce management costs over a long term commitment; improve superior/subordinate

relationships; improve partnership between management and employees; and encourage a continuous improvement approach amongst employees.

Chapter Ten

Conclusions and Recommendations

10.1 Introduction

This research has undertaken a qualitative study to devise an implementation model for the effective integration of empowerment within construction organisations. To achieve this, the study has undergone four major phases of investigation:

1. Detailed literature review;
2. Postal questionnaire survey;
3. Case studies of selected companies who have implemented empowerment; and
4. A feasibility study.

As a result of the work, a generic model and best practice framework for effective implementation of empowerment in construction organisations was developed, and subsequently validated. The validation techniques adopted in this research were triangulation (including replication) and a feasibility study. These have demonstrated a logical coincidence amongst them to confirm that the implementation framework is robust in being able to achieve the set research objectives. Having discussed (in detail) and subsequently confirmed these findings throughout this thesis, this final chapter concludes the main findings and just as importantly, their limitations. Finally, the chapter offers direction for future research, to continue and build further, upon this theme.

10.2 Main conclusions

The main conclusions of this study are briefly presented in this section. It includes: a description of the significance of empowerment activities and their implications in terms of usage in the UK construction sector; the use of DFD modelling techniques to ascertain the efficacy information and relevant processes in the implementation of empowerment; the feasibility of the generic model and its limitation to use in construction organisations; and benefits of empowerment to the construction sector as a whole.

10.2.1 Empowerment activities

As an initial framework, a set of sixty-two empowerment activities were identified from the literature search. It was subsequently confirmed (through a postal questionnaire survey) that sixty-one of these (constituted the development of an Empowerment Activity Model (EAM)] are crucial in the implementation of empowerment. Analysis of the construction and manufacturing sub-samples surveyed in this work showed that manufacturing is slightly ahead in using these activities.

Following the EAM, an Involvement Chart (showing significant involvement at four organisational levels) and an Empowerment Implementation Profile (EIP) to measure the degree of empowerment implementation, were developed. The main conclusions regarding usage of empowerment activities are as follows:

- The respondent companies employed empowerment activities within their organisations to a similar extent as they perceived them as being important. This underlines the validity of the activity model (which shows the importance of activities in descending order). The activity model was fully elucidated in Chapter six.

- Employees at the strategic, general, and operational levels of an organisation assume greater responsibility in implementing empowerment than employees at the direct work level.

- The activities of 'leadership', 'resources development' and 'empowerment system' require inputs from employees in the descending order of hierarchy, i.e., strategic - general - operational - direct work. Whereas, 'teamwork' and 'process improvement' receive the following order of involvement: operational - direct work - general - strategic. This shows that provision of a suitable environment and necessary resources are the key responsibilities of management, whilst, having obtained such provisions, process improvements lie in the hands of employees themselves

Use

- The 'Empowerment Activity Model' (EAM) can be used by companies (who intend to implement empowerment) as an indicator of areas (activities) of importance in devising suitable implementation strategies for their own organisations.

- The 'Involvement Chart' produced along with the EAM will assist users by highlighting significant involvement of, and input by, the four organisational levels of an organisation (i.e. strategic, general, operational, and direct work) in performing those activities.

- The Empowerment Implementation Profile (EIP) produced along with the EAM can be used by companies as a tool to benchmark their level of implementation of empowerment. The details of how to use the EIP model were fully explained in Section 6.5.6 (Chapter Six).

Limitations

Development of the above models were based on the data obtained from twenty-seven construction companies and twenty-six manufacturing companies. These models were not tested for industry-wide application (i.e. generalising findings of the sample analysis to the entire population). This is because the objective of the (survey) inquiry was predominantly to test the theory developed from the literature search. Bearing this limitation in mind, application of these particular findings is subjected to the characteristics of an individual organisation who might wish to apply them. However, they can be considered as indicators for any construction company wishing to design their own implementation strategies.

Another limitation is concerned with the use of the EIP model. This model was developed based on the extent of 'use' of empowerment activities by the respondent companies at the time of investigation. However, companies continuously use the activities to a reasonably full extent (over a period of time). Therefore, continued use of the model is subjected over period of time.

10.2.2 The use of DFD (Data Flow Diagram) in modelling the empowerment process

One of the main objectives of this research was to map the empowerment processes (activities) and identify self-efficacy information that are required to effectively perform those processes. To achieve this, a number of modelling techniques were investigated (in the light of systems analysis), and in the end, the Data Flow Diagram (DFD) (one of the Structured Data Analysis techniques) was used. This usage was based on the following reasons:

- The components of DFDs include processes, data flows, data stores, and sources/sinks. Therefore, processes/activities and their linkages can be efficiently mapped using this technique. These are suitable for modelling efficacy-information in an empowered organisation.

- DFDs are graphical, partitioned, and multi-dimensional, thereby allowing accurate analysis of very complex systems.

- Hierarchical modelling in DFD allows one to analyse the primitive functions of a system at a more detailed (series of) levels.

Using DFD techniques, a generic model was developed for implementing empowerment in construction organisations. Organisations can use the DFD technique to map their current physical systems and subsequently compare them with the generic model to design their own (logical) systems (i.e. that are most appropriate to them). For instance, organisations can map their current systems (regarding processes shown in the generic model) using the DFD technique to understand how they currently operate. Subsequently, a current system can be compared with the generic model to redesign (if needed) for developing a logical system that is updated and considered as being most relevant for that organisation. This process will also help companies to identify and avoid non-value added activities (or flows) that might exist in their current systems.

10.2.3 The generic model and best practice framework

A careful and comprehensive analysis of the three case study companies led to the development of a generic model (along with a best practice framework), which shows

clearly the elements of empowerment and methods of implementation. The major conclusions drawn from the development of the generic model are as follows:

The final generic model and the best practice framework have achieved external validity (i.e., the 'replication' logic as discussed in Chapter Four). That is, the research, in general, observed a similar pattern of major events of empowerment implementation across different settings. In essence, a logical consistency in the implementation approach was observed amongst the three companies. This highlighted the reliability of the model and, that the model can be implemented in other companies having similar characteristics of the case-study companies studied.

Stage two of external validity was testing of the model for its feasibility, by obtaining industry feedback on technical, operational, and economical feasibilities of applying the model in construction organisations. Such feasibility assessment by experts (from industry) revealed the following conclusions:

- The detailed assessment of various feasibility criteria (associated with economical, social, and technical aspects) against seven leading construction companies suggested that the generic model is feasible to be applied to various types of construction organisations.

- It has evolved that the model would: radically improve training and employee skills; radically change the operating systems of construction organisations; reduce management costs over a long term commitment; improve superior/subordinate relationships; improve partnership between management and employees; and encourage a continuous improvement approach amongst employees.

Internal validation of the model was performed by observing convergence of information (findings) amongst three major investigations of this research viz: literature search; questionnaire survey; and case studies. Such validation has confirmed that there have been several compromises amongst these investigations to suggest the model as being valid for implementation in construction organisations. Some of the key observations from this component are as follows:

- Empowerment activities identified from the literature review were perceived as important by questionnaire respondents. Subsequently, case studies also confirmed them as crucial in the actual implementation of empowerment.

- The pattern of organisational involvement (see Involvement Chart in Chapter Six) in the implementation of empowerment as developed from the questionnaire survey was found to exist in actual implementation (see generic model).

- The nine major propositions (based on the literature review) initially made in this research, have been confirmed by the generic model.

Use

The derived model provides the user with a methodology of implementation, along with a database of information. Using this, the user can tailor a plan suitable to the needs and characteristics of their organisation to effectively implement empowerment. To assist in this objective, (besides the generic model) a conceptual model along with flow chart models were also provided for the user to easily understand what activities (or processes) should go on in the empowerment system and, who (in the organisation) should be involved in performing them.

Limitations

Feasibility of the generic model was mainly based on seven leading construction companies. Therefore, the model inherently will have strong influence of the characteristics of these companies (see Chapter Nine for details of these companies). These characteristics are as follows:

- Total employee size approximately range between 200 and 2000.
- Annual turnover range between £50m and £1800m sterling.
- A number of regional units operating both in the UK and abroad.
- Direct labour is negligibly employed for site operations. Either the work is sublet to sub-contractors or labour only sub-contractors are hired for manual work.

In view of these constraints, several limitations in the potential application of the generic model need to be highlighted.

Some of the best practices of the model may be suitable only for large organisations, having diverse locations, and operating simultaneously in several disciplines like civil engineering, building, offshore, and so on. For instance, the model suggests: development of both company level and regional level visions for future improvements; and development of company level and regional level improvement plans based on feedback (problems) received from external customers and suppliers. Duplication of such efforts at both company level and regional level would be suitable for larger organisations serving different customers with different interests. To satisfy a particular type of customer (e.g. industrial building), a particular region or division of an (large) organisation may have to set their own agenda (vision) for improvements. In this regard, smaller organisations, having very few regional offices concentrating on single type of customers, may not need to duplicate their improvement efforts at regional level.

However, the basic theme that underlies the above practices (i.e. management continuously develops company wide improvement plans from problems that emerge from customers' feedback, and provides them to empowered employees to implement them at operational level) is applicable to any type of organisation regardless of size or other constraints.

In essence, the model may serve larger organisations (having similar characteristics as the three case study organisations) more efficiently than smaller ones. However, the logic underlying overall implementation can be considered as suitable to types of organisation regardless of their characteristics.

Another important constraint is concerned with the employment of direct labour by construction organisations. All of the three organisations studied employed a meagre number of direct labour to undertake site operations (non-case companies stated they employ direct labour, but it was not assessed in detail as what extent this was the case). Either the work was sublet to sub-contractors or labour only sub-contractors were hired for operatives at the time of investigation. This was due to several influences including, the type of procurement, nature of projects, and so on. Discussions of these influences are beyond the scope of this research. In view of this position, the model may require tweaking to take account of full direct labour at operational level.

One of the main drivers for the model to take account of this 'tweaking' is the latest Tax Deduction Scheme proposed by the Inland Revenue (IR 157, 1997). For many years, it has been the practice in UK construction to treat labour (hired from labour agencies) working in the construction industry as self-employed, when in reality, they may really be classed as direct employees. According to the new scheme, contractors using workers directly employed by labour agencies are expected to be levied (tax) on these workers at

the reduced rate they now pay for self-employed workers on their sites. In the wake of this new situation, according to a recent investigation by the Construction Industry Training Board (Barrie, 1997), direct employment in UK contracting will rise 20 per cent by April 1998. (For small firms this will be nearer 40 per cent, and for larger contractors, it will be closer to 18 per cent). It is also revealed that many companies have still not decided how to deal with this 'crackdown'. In view of the timing of this research, the generic model was not able to take account of these recent development, and therefore, it needs further investigation with respect implementation at labour level.

It should be borne in mind that case study data collection relied on information supplied by the top management (eg. Directors, Chief Executives). Hence, this may have imparted a degree of bias into the model, and that therefore the model implementation at lower levels of the organisation is subjected to the constraints of those levels.

10.2.4 Benefits of empowerment

The four major investigations of this research (i.e., literature search, questionnaire survey, case studies, and feasibility study) revealed several benefits of empowerment implementation. All of the three case companies enjoyed improved business performance (both strategic and operational) since the implementation of empowerment. These improvements included: increased market share; new customer base; increased working to schedule; reduced accidents; reduced customer complaints; and reduced rework or waste. However, the research did not substantially vindicate that these improvements were direct results of empowerment implementation, because such investigation was beyond the scope of this research. Other perceived benefits included the following:

- Improved superior/subordinate relationship was one of the key benefits of empowerment. Their relationship has changed into one of co-operative and proactive rather than reactive. As a result, their relationship yielded less conflict, common interests and common corporate objectives.

- Empowerment organisations act as 'learning organisations', where employees including the senior management continuously learn new practices and skills. This greatly improves skills of employees and enables them to efficiently handle their business problems better.

- Employees enjoy a greater freedom of decision making at their own business level. Such freedom in addition to moral support and participation (in their processes) by superiors (or senior management) encourage them to be more productive.

10.3 Recommendations for future work

To date, minimal research has been conducted on empowerment in the UK construction industry. This research has clarified the fundamental issues (elements) of the empowerment concept and produced a generic framework for effectively implementing it in construction organisations. Having a number of limitations, as discussed throughout this chapter, the framework needs further investigations for its most optimum implementation. Therefore, some of the key areas for further research are recommended below.

The research, as far as possible, identified and confirmed most of the key empowerment activities (and produced an activity model) that are critical in the implementation of empowerment. However, in the continuous improvement approach, a constant demand

for change is envisaged for ongoing improvements. This might lead to (empowerment) practitioners continuously identifying and introducing new activities (or novel methods) in their business. Therefore, a periodic (perhaps cyclic) investigation is required in order to update the activity model (including the EIP [Empowerment Implementation Profile]). Updating these models will also serve to furnish construction organisations with benchmarking tools to compare their progress against industry-wide practice.

The generic model was developed based on the experience of three case companies. As discussed earlier in Chapter Four and Chapter Eight, unlike a truly 'statistical' approach, this model can not be generalised to an entire population (construction industry). Generalisation, in this instance would be testing a theory through replication of the research findings, in a second or even a third neighbourhood (cases), where the theory has specified that the same results should occur. Once such results have been uncovered, the results might then be accepted for a much larger number of similar neighbourhoods (construction companies).

This research has confirmed a logical consistency in the implementation approaches of the three cases, and finally developed a generic model. This was further confirmed through feasibility studies on several (seven) companies, including the case companies. As stated above, the research concluded that the model can be considered for application to a large number of organisations having similar characteristics of those companies who participated in the feasibility study. In this case, the model is subjected to apply to a variety of organisations having different characteristics. This provides an opportunity to undertake a research on applying this model to various other types and sizes of construction organisations.

The feasibility study has indicated that the 'Self-Management System' (a sub system of the generic model) seeks a radical change in the way in which construction organisations operate with respect to employees' self-development and process improvements. Therefore, an investigation on how to reengineer construction organisations for effective application of the self-management system can be undertaken. This also includes investigation on changing roles and attitudes of employees and their implications on the effective implementation of the self-management system.

As discussed earlier in Section 10.2.3, recent investigation of the implications of the new Inland Revenue (tax) on construction companies indicated a strong inclination of construction companies towards appointing direct labour in the near future. In the wake of this recent development, a research on applying the generic model at direct labour level would assist construction companies to effectively apply this concept at direct work level. Such an investigation would also solve the problem of efficiently training the construction workforce. This is a 'problem' that the Construction Industry Training Board has been trying to solve for a long time.

The performance [strategic and operational business performance (SBP and OBP)] of case companies indicated that they have been enjoying a number of improvements since the implementation of empowerment, including: improvements in annual turnover; less waste and rework; increased employee involvement; and increased customer satisfaction (see Chapter Eight, Section 8.7). However, it was not studied in detail as to how these improvements were directly attributed to empowerment. Investigation of such linkages (i.e. between empowerment implementation and business performance improvements) would assist construction companies to focus their implementation efforts directly towards achieving business improvements. To achieve this, the SBP and OBP measures, identified

by this research, can be explored as to how they are influenced by the generic model (and the activity model).

Finally, it is acknowledged that no amount of business or organisational improvement can be 'thrust' upon an industry. It is long recognised that UK business is slow, even averse, to change. This phenomenon in itself may constitute a research all of its very own.

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Appendix - A

Empowerment Questionnaire

TEXT BOUND INTO THE SPINE

Empowerment Questionnaire

Empowerment is a process of enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and informal techniques of providing efficacy information. It includes both participation in decision making and delegation of authority to take decisions.

TRODUCTION

re is currently a high level of dissatisfaction amongst UK clients of the construction industry regarding the delivery of pleted projects, the quality of service, and predictability of cost. This requires the need for design, and construction anisations, to fundamentally rethink and redesign their processes. In order to address these problems, this research orporates two interrelated concepts: process improvement, and empowerment concepts. The objective of the work is to elop an application model of the empowerment concept to improve construction contractor's performance potential. Since e concepts are well established in the manufacturing industry, the construction industry could adopt the appropriate culture technology prevalent in manufacturing and improve the way in which construction processes and contractor organisations organised. Taking this into account, this research has identified the critical activities required for implementing the concept mpowerment within an organisation.

is questionnaire is part of the research which aims to assess perceptions amongst both the manufacturing and construction ors, on empowerment activities.

her research will investigate how these activities can be performed efficiently and what changes (cultural, organisational, process etc.) are required for implementing them.

r valid input is critical to the success of this research; thank you for your time. Please return the completed questionnaire ng the self-addressed envelope provided to:

Jawahar-nesan, Doctoral student.
hool of Construction, Engineering and Technology
iversity of Wolverhampton
olverhampton
. WV1 1SB

uld you have any queries, please do not hesitate to contact:
Jawahar-nesan (Tel: 01902 322286)
Gary Holt (Tel: 01902 322263)

SECTION ONE

Company Profile

Would you be prepared to provide your company name and address:_____

_____(Tel:).

Type of company:

(please circle appropriately)

Manufacturing	1
Construction	2
Other (please specify)	3

_____

If construction, what type of work is your company predominantly involved in:

Civil Engineering	1
Building	2
Engineering	3
Offshore	4

Respondent data *(please circle appropriately)*

Name and designation of respondent:_____ .

Number of years the respondent has been in the (manufacturing/construction/others) industry:_____Years.

Would you like a summary of this questionnaire survey results? Yes 1 No 2

Would you be prepared to participate in future aspects of this research? Yes 1 No 2

Empowerment involvement *(please circle appropriately)*

Please indicate your level of *awareness* of the concept of employee empowerment.

Not at all		Some awareness		Fully understand the concept
1	2	3	4	5

Do you practice the empowerment concept in your organisation? Yes 1 No 2

If yes, how long has your company been adopting the empowerment policy?_____years.

SECTION TWO

section lists and defines the activities that are important when an organisation implements the empowerment concept. The ties are grouped under nine major headings: leadership; resources development; involvement; recognition; empowerment , process improvement; education and training; measurement; and teamwork. *Respondents are requested to answer both ions attached to each activity description: [A] - your level of agreement with activities and [B] - the extent of activities being within your organisation. Please circle a number on the scale to represent your levels of [A] agreement and [B] usage.*

dership activities

n/mission
ement which visualises the desired future state of the overall business. rocedures, goals and standards of the business are established to achieve vision. Vision statements are usually cascaded down to "missions" which shorter-term site aims or departmental aims.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

gement commitment
ement of management in establishing new goals and directions for the any and then leading the entire workforce towards the achievement of goals. These include: a sense of belonging created by an informed and ed workforce; development of pride, trust and responsibility for results; roduce confidence in management leadership.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

model
rs at all levels of management structure play exemplary roles in the mentation of process of change, where in the other members of a department or organisation are encouraged to observe and follow the des and behaviour of leaders.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

pions of empowerment
iduals who are comprehensively trained in the application of quality and owerment activities by participating in teams and the general work ss. They are expected to transfer the empowerment ideology, knowledge kills to others.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

utives walkthroughs
management staff often walk through the plant/department or site and with employees. This ensures commitment of the management, also oyees receive immediate feedback regarding their performance.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

uragement
urage employees to adopt the changed culture required for mentation of empowerment and take responsibility to improve the sses they own.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

litation
ling employees to take part in the empowerment process and equipping with the necessary skills and techniques to make improvements in their activities.

[A]Strongly disagree **Strongly agree**
1 2 3 4 5
[B] Not at all using **Using fully**
1 2 3 4 5

ources development activities

isational restructuring
ing the organisational structure into one suitable for implementing the erment concept. This includes decentralising the structure and levels ision making.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

ing conditions
ion of favourable working environment for employees to make them feel rtable. This includes a clean working atmosphere, canteen, recreation , and working space etc.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

ng
ing that sufficient funds are available for implementation of change.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

lvement activities

yee involvement
ement of employees in their business related improvement activities, es and cross-functional activities.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

mer (external) involvement
ers are involved in the business to perceive their changing ements and satisfaction. This includes visiting customer's premises, g customers to visit the company, and accessing customer conferences ports.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

er (external) involvement
rs are involved in the business to enable them to understand the d standard, specification and delivery time for the product or service pply.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

ary participation
agement of employees to participate voluntarily in the empowerment This includes voluntary participation in training and other erment activities.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

nces filing
ces of employees (resulting either from employer imposing detrimental g conditions on employees or from internal feelings of unhappiness frustration) are filed, so that management can resolve them quickly and

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

ee satisfaction
ction of employees on their jobs, working conditions, and management etc. Management continuously assesses its employees on their ction; any dissatisfactions perceived are analysed and rectified.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

er satisfaction
el of customer satisfaction on the supplied product/service is ined through questionnaire surveys, personal interviews, telephone , and seminars conducted within the customer organisation.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

cognition activities

ard system
rmal system for recognition of empowerment achievements of employees. s can be financial, prices or simply thanks to individuals or teams who accomplished performance achievements in their business.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

d ceremony
eeting conducted in order to celebrate individual's or group's rements. Small gifts can be presented to the celebrities.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

entations
entations to management or all employees are performed by individuals or s to explain their quality or productivity achievements.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

powerment system activities

owerment system
stem that describes a set of policies, procedures and activities by which a pany can establish, document and maintain an effective and economic owerment management.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ty policy
overall quality intentions and directions of an organisation as regards to ty, as formally established by top management.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

edures
ments which define the aim and scope of an activity, which also describe hom, how, when, and where the activity is to be carried out.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

s of employees
ments which describe a pattern of behaviour typical of employees in ion to their processes. This includes a reporting system and relationships other employees.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

owerment implementation plan
lan which describes the methodology of the implementation process of owerment. This includes by whom, when and where the activities of lementation are to be performed.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ocess improvement activities

lem solving
ifying and prioritising problems and finding appropriate solutions. This des statistical analysis and plan-do-check-act procedures.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

labour/management problem solving process
s comprised of both employee and management plan and solve problems, h develop broadly owned, jointly developed priorities for improvement ghout the organisation.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

rtment improvement plan
s developed by individuals and/or teams within a department to improve ities and processes controlled by the department.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ite (plant) improvement plans
e plans set priorities, identify resources and establish time frames ssary to meet jobsite improvement objectives. Both middle management down level workforce are engaged in producing these plans.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

istical process control
lysis of a process or its outputs using statistical techniques so as to take opriate actions to improve the effectiveness of the process.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

cess evaluation
processes are analysed and evaluated using a plan-do-check-act cycle to inate non-value-added activities, minimise obstacles and constraints and rove quality, productivity and safety.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

cess ownership
horising individuals and/or teams to take responsibilities of respective cesses they perform, and are held accountable for quality they achieve and rs they commit regarding their processes.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

lity function deployment
ystem for translating customer requirements into company requirements at y stage of a business process, from inception to completion. This is a ematic deployment of the relationships between the requirements stomer) and quality of the product.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

wered levels of decision making
ployees at all levels of the organisation are empowered to take decisions ted to their business operations within parameters established by the nagement.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

o-way communications
continuous flow of information between management and employees, viduals, teams, and departments, on matters regarding process provement.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ducation and training activities

raining
raining of individuals and groups on implementation and use of various ality and empowerment tools. This includes training on statistical tools and am working etc.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ill development
evelopment of skills on technical, administrative, and interpersonal matters. hese include production, problem solving, and communication skills.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ill certification
his is the process of testing employees after intensive training on various ills required to manage their own work. This certification ensures that the ertified employees are eligible to manage and inspect their own work.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...lay boards
...s are set up at a visible places to provide an information centre for all ...oyee improvement activities. Team meetings notices, minutes, and ...ements can be displayed for everyone to read.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...ers
...s can be used to increase awareness of empowerment and provide ...gnition of achievements.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...nical cross-training
...ing employees on various related specialised jobs. This allows team ...bers to acquire different skills and move from job to job within the team ..., and thus form flexibility and innovation in the team.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...owerment awareness
...blishing a common understanding of the concept of empowerment among ...oyees. This enables employees to understand their role within the ...isation and build an 'empowerment attitude' into the business.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...letters
...letters are used within the company to increase awareness and recognise ...ements.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...lier training
...ing undertaken by the supplier with the assistance of the purchaser to ...ve the quality of products/services being supplied. This also enables the ...lier to understand the empowerment policy/system of the purchaser.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...managing training
...s of various departments or functions identify their operational or ...onal training needs, and accordingly train themselves in achieving ...sary skills in line with the identified training needs.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...asurement activities

...erformance evaluation
...inuous evaluation of performance of employees on their related job. This ...des: product/service deficiencies; skill improvement; and productivity.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...hmarking
...mal process of measuring and comparing a company's product, process or ...ce against those of the top performing companies in industry.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...assessment of performance
...iduals or teams are empowered to assess the quality of their performance ...selves at their own functions. They are thoroughly trained to perform ...function.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

...nostic survey
...rvey or audit is conducted to assess the capability of the organisation to ... the empowerment concept. This is used at the beginning of the ...owerment process to highlight problem areas.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

mentation
ding an act, condition or event which bears an effect on the objective of levant process. This includes recording both the success and failure of s spent on the process.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ection
ring and testing products, processes and services against predetermined or standards.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ling
up of items or individuals, taken from a larger collection or population, provides information needed for assessing characteristics of the ation.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

mwork activities

meetings
of all kinds at all levels of the organisation conduct meetings frequently alyse problems, improve processes, resolve conflicts, and celebrate ements. This includes meetings of inter and intra teams.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

rected work teams
tact group of workers who are highly trained, form a natural unit of manage and co-ordinate their work activities with a minimum of direct vision. These teams own responsibility for their performance.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

dination
ing individuals and/or teams to function together efficiently for a on goal.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

building
tion of teams resulting from group cohesion, effective leadership and ive interaction among team members, so that the members of a team co-e, share common goals and possess common attitudes.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ory committees
ittees represented by middle and down levels of the organisation. These ittees have the authority and expertise to make significant operational ons, to manage resources, and support off-line problem solving teams on op floor.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

decision making
oup of individuals meets together, analyses an issue and decides upon ve solutions. The group can be within a team or department, or iduals from several teams depending on the type of issue.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

ict resolution
ving conflicts or differences that occur between individuals, teams or ments. This includes analysis of the issue that triggers the conflict, ations with parties involved, emergence of compromises, and final ment of the conflict.

[A]Strongly disagree Strongly agree
1 2 3 4 5
[B] Not at all using Using fully
1 2 3 4 5

-functional teams
s comprised of experts or individuals from different functional areas and sses. These teams focus on improving cross-functional issues and ities.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

ty improvement teams
s established at various levels of an organisation to improve quality of ervice and product. These teams help to train team members and other loyees on quality tools, techniques and principles.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

setting
s or individuals set goals for process improvement. This includes: ing the object of the goal; the importance of the goal for both the idual and the organisation; the method by the goal is to be achieved; and egree of goal commitment.

[A]Strongly disagree — Strongly agree
1 2 3 4 5
[B] Not at all using — Using fully
1 2 3 4 5

SECTION THREE

objective of this section is to investigate the significance of roles of employees at four levels of an organisation in implementing forming) the nine major empowerment activities. The four levels of an organisation are *strategic, general, operational, and t work.* Although the majority of the sub-activities (listed in the previous section) require all employees to be involved in them, should be attributable to employees of a particular level of the organisation to be involved in performing more than the loyees of other levels. *Please indicate your perceived significance of the importance of employee (of the four levels of the nisation) involvement in each of the empowerment activities. (Please circle appropriately).*

Empowerment activities	Levels of organisation	Strongly insignificant				Strongly significant
dership	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
urces development	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
lvement	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
gnition	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5

owerment system	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
ess improvement	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
cation and training	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
urement	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5
work	Strategic	1	2	3	4	5
	General	1	2	3	4	5
	Operational	1	2	3	4	5
	Direct work	1	2	3	4	5

wish to add any comments in respect of the nature of this research, or this questionnaire?

Thank you for your co-operation

return in the attached self addressed envelope to:

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l of Engineering and the Built Environment
sity of Wolverhampton
hampton
WV1 1SB

Appendix - B

Questionnaire Survey Analysis

Questionnaire Survey Analysis

Part I

Empowerment activities - Frequency analysis and Ranking (agreement scale)

Table 1. Leadership activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Facilitation	100.0	92.3	96.1	5
Encouragement	92.6	92.3	92.4	5
Management commitment	88.9	88.4	88.7	5
Role model	85.2	96.2	90.6	5
Executives walkthroughs	85.2	84.6	84.9	5
Vision/mission	85.1	80.8	83.0	5
Champions of empowerment	70.0	88.5	79.2	4
Average percentage	86.7	89.0	87.8	

* Central tendancy: 4-agree, 5-strongly agree.

Table 1.1. Leadership activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Facilitation	0.91	0.93	0.92	1
Encouragement	0.91	0.91	0.91	2
Management commitment	0.90	0.91	0.90	3
Role model	0.87	0.90	0.89	4
Executives walkthroughs	0.88	0.86	0.87	5*
Vision/mission	0.85	0.90	0.87	6
Champions of empowerment	0.81	0.86	0.84	7
MAgi =	0.86	0.90	0.89	

* Based on percentage response scored above median value on the agreement scale.

Table 2. Resources development activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Funding	88.8	92.3	90.6	5
Working conditions	85.1	84.6	84.9	5
Organisational restructuring	81.4	92.3	86.8	4
Average percentage	85.1	89.7	87.4	

* Central tendancy: 4-agree, 5-strongly agree.

Table 2.2. Resources development activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Funding	0.86	0.91	0.88	1
Working conditions	0.86	0.88	0.86	2
Organisational restructuring	0.81	0.88	0.84	3
MAgi =	0.84	0.89	0.86	

Table 3. Involvement activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Customer (external) involvement	88.8	92.3	90.6	5
Supplier (external) involvement	92.5	92.3	90.6	5
Customer satisfaction	92.6	84.6	88.7	5
Employee involvement	85.1	92.3	88.7	5
Employee satisfaction	81.4	61.6	86.8	4
Voluntry participation	81.4	84.6	83.0	4
Grievances filing	74.0	80.7	77.3	4
Average percentage	85.1	84.1	86.5	

* Central tendancy: 4-agree, 5-strongly agree.

Table 3.1. Involvement activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Customer (external) involvement	0.86	0.91	0.89	1
Supplier (external) involvement	0.87	0.90	0.88	2*
Customer satisfaction	0.90	0.86	0.88	3
Employee involvement	0.83	0.91	0.87	4
Employee satisfaction	0.83	0.88	0.85	5
Voluntry participation	0.80	0.87	0.84	6
Grievances filing	0.81	0.85	0.83	7
MAgi =	0.84	0.88	0.86	

* Based on percentage response scored above median value on the agreement scale.

Table 3.2 Involvement activities - Relative agreement indices and ranking

Activities	Construction	Rank
Customer satisfaction	0.90	1
Supplier (external) involvement	0.87	2
Customer (external) involvement	0.86	3
Employee involvement	0.83	4*
Employee satisfaction	0.83	5
Grievances filing	0.81	6
Voluntry participation	0.80	7
MAgi =	0.84	

* Based on percentage response scored above median value on the agreement scale.

Table 3.3 Involvement activities - Relative agreement indices and ranking

Activities	Manufacturing	Rank
Employee involvement	0.91	1*
Customer (external) involvement	0.91	1*
Supplier (external) involvement	0.90	2
Employee satisfaction	0.88	3
Voluntry participation	0..87	4
Customer satisfaction	0.86	5
Grievances filing	0.85	6
MAgi =	0.88	

* Both percentage response scored above median value on the agreement scale and Agi are same.

Table 4. Recognition activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Reward system	96.3	84.6	90.6	5
Presentation	77.7	76.9	77.3	4
Award ceremony	59.2	57.7	58.5	4
Average percentage	77.7	73.1	75.5	

* Central tendancy: 4-agree, 5-strongly agree.

Table 4.1. Recognition activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Reward system	0.90	0.88	0.89	1
Presentation	0.81	0.84	0.82	2
Award ceremony	0.78	0.78	0.78	3
MAgi =	0.83	0.83	0.83	

Table 5. Empowerment system activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Quality policy	88.9	96.1	92.4	5
Procedures	81.5	77.0	79.2	5
Roles of employees	61.6	57.7	62.2	4
Empowerment system	70.3	57.7	64.2	4
Empowerment implementation plan	51.8	53.8	52.8	4
Average percentage	70.8	68.5	70.2	

Table 5.1. Empowerment system activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Quality policy	0.89	0.93	0.91	1
Procedures	0.86	0.83	0.84	2
Roles of employees	0.75	0.75	0.75	3
Empowerment system	0.75	0.73	0.74	4
Empowerment implementation plan	0.72	0.71	0.72	5
MAgi =	0.79	0.79	0.79	

Table 6. Process improvement activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Two-way communications	96.3	96.1	96.2	5
Process ownership	100	96.1	98.1	5
Lowered levels of decision making	92.6	96.2	94.4	5
Problem solving	81.4	96.1	88.7	5
Joint labour/management problem solving process	88.9	88.4	88.7	5
Department improvement plan	85.2	92.3	88.7	5
Quality Function Deployment	66.6	92.3	79.2	5

Table 6 contd.				
Jobsite improvement plans	92.6	76.9	84.9	4
Process evaluation	74.0	92.3	83.0	4
Statistical process control	59.2	92.3	75.5	4
Average percentage	83.7	91.9	87.7	

Table 6.1. Process improvement activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Two-way communications	0.90	0.93	0.92	1
Process ownership	0.91	0.91	0.91	2*
Lowered levels of decision making	0.89	0.92	0.91	3*
Problem solving	0.84	0.95	0.89	4**
Joint labour/management problem solving process	0.87	0.91	0.89	4**
Department improvement plan	0.87	0.90	0.89	4**
Quality Function Deployment	0.78	0.92	0.85	5
Jobsite improvement plans	0.85	0.83	0.84	6
Process evaluation	0.79	0.88	0.83	7
Statistical process control	0.72	0.91	0.81	8
MAgi =	0.84	0.91	0.87	

* Based on percentage response scored above median value on the agreement scale.

**Both percentage response scored above median value on the agreement scale and Agi are same.

Table 6.2. Process improvement activities - Relative agreement indices and ranking

Activities	Construction	Rank
Process ownership	0.91	1
Two-way communications	0.90	2
Lowered levels of decision making	0.89	3
Joint labour/management problem solving process	0.87	4
Department improvement plan	0.87	5
Jobsite improvement plans	0.85	6
Problem solving	0.84	7
Process evaluation	0.79	8
Quality Function Deployment	0.78	9
Statistical process control	0.72	10
MAgi =	0.84	

Table 6.3. Process improvement activities - Relative agreement indices and ranking

Activities	Manufacturing	Rank
Problem solving	0.95	1
Two-way communications	0.93	2
Lowered levels of decision making	0.92	3*
Quality Function Deployment	0.92	4
Process ownership	0.91	5*

Table 6.3 contd.

Statistical process control	0.91	6*
Joint labour/management problem solving process	0.91	7
Department improvement plan	0.90	8
Process evaluation	0.88	9
Jobsite improvement plans	0.83	10
MAgi =	0.91	

* Based on percentage response scored above median value on the agreement scale.

Table 7. Education and training activities - activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Skill development	96.3	96.1	96.2	5
Training	81.4	92.3	86.8	5
Technical cross-training	81.4	96.1	88.7	5
Display boards	88.9	84.6	86.8	4
Empowerment awareness	85.1	88.5	86.8	4
Skill certification	74.0	88.4	81.1	5
Self-managing training	81.4	80.8	81.1	4
News letters	81.4	73.1	77.4	4
Supplier training	70.3	84.7	77.3	4
Posters	62.9	69.2	66.1	4
Average percentage	80.3	85.4	82.8	

Table 7.1. Education and training activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Skill development	0.90	0.95	0.92	1
Training	0.86	0.95	0.90	2
Technical cross-training	0.84	0.92	0.88	3
Display boards	0.84	0.88	0.86	4**
Empowerment awareness	0.86	0.87	0.86	4**
Skill certification	0.82	0.88	0.85	5
Self-managing training	0.81	0.84	0.83	6*
News letters	0.83	0.83	0.83	7*
Supplier training	0.81	0.85	0.83	8*
Posters	0.75	0.80	0.77	9
MAgi =	0.83	0.88	0.85	

* Based on percentage response scored above median value on the agreement scale.

**Both percentage response scored above median value on the agreement scale and Agi are same.

Table 7.2. Education and training activities - Relative agreement indices and ranking

Activities	Construction	Rank
Skill development	0.90	1
Empowerment awareness	0.86	28
Training	0.86	3

Table 7.2 contd.

Display boards	0.84	4*
Technical cross-training	0.84	5
News letters	0.83	6
Skill certification	0.82	7
Self-managing training	0.81	8*
Supplier training	0.81	9
Posters	0.75	10
MAgi =	0.83	

* Based on percentage response scored above median value on the agreement scale.

Table 7.3. Education and training activities - Relative agreement indices and ranking

Activities	Manufacturing	Rank
Skill development	0.95	1*
Training	0.95	2
Technical cross-training	0.92	3
Skill certification	0.88	4*
Display boards	0.88	5
Empowerment awareness	0.87	6
Supplier training	0.85	7
Self-managing training	0.84	8
News letters	0.83	9
Posters	0.80	10
MAgi =	0.88	

* Based on percentage response scored above median value on the agreement scale.

Table 8. Measurement activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Inspection	88.9	88.5	88.7	4
Job performance evaluation	85.1	84.6	84.9	5
Benchmarking	81.4	76.9	79.2	5
Self-assessment of performance	74.0	84.7	79.2	4
Sampling	62.9	69.2	66.0	4
Documentation	55.5	69.2	62.3	4
Diagnostic survey	59.2	65.4	62.2	4
Average percentage	72.4	76.9	74.6	

Table 8.1. Measurement activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Inspection	0.83	0.90	0.86	1*
Job performance evaluation	0.85	0.88	0.86	2*
Benchmarking	0.84	0.88	0.86	3
Self-assessment of performance	0.81	0.84	0.82	4
Sampling	0.73	0.81	0.77	5
Documentation	0.73	0.78	0.75	6*
Diagnostic survey	0.73	0.78	0.75	7
Agi	0.79	0.84	0.81	

* Based on percentage response scored above median value on the agreement scale.

Table 9. Teamwork activities - Percentage scoring (>3 on agreement scale)

Activities	Construction	Manufacturing	Total sample	Median *
Team building	100	92.3	96.2	5
Team meetings	92.6	96.1	94.3	5
Co-ordination	88.9	92.3	90.6	5
Goal setting	92.5	92.3	92.5	5
Cross-functional teams	92.6	84.6	88.7	5
Self-directed work teams	81.4	96.1	88.6	5
Quality improvement teams	85.1	84.6	84.9	4
Group decision making	85.2	84.6	84.9	4
Conflict resolution	88.8	77.0	83.0	4
Advisory committees	48.1	38.5	43.4	3
Average percentage	85.5	83.8	84.7	

Table 9.1. Teamwork activities - Relative agreement indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Team building	0.93	0.94	0.93	1
Team meetings	0.91	0.91	0.91	2
Co-ordination	0.89	0.91	0.90	3
Goal setting	0.87	0.92	0.89	4*
Cross-functional teams	0.89	0.90	0.89	5
Self-directed work teams	0.83	0.92	0.87	6
Quality improvement teams	0.84	0.88	0.86	7
Group decision making	0.82	0.87	0.84	8*
Conflict resolution	0.85	0.84	0.84	9
Advisory committees	0.67	0.69	0.68	
MAgi =	0.85	0.89	0.86	

* Based on percentage response scored above median value on the agreement scale.

Table 9.2. Teamwork activities - Relative agreement indices and ranking

Activities	Construction	Rank
Team building	0.93	1
Team meeting	0.91	2
Cross-functional teams	0.89	3*
Co-ordination	0.89	4
Goal setting	0.87	5
Conflict resolution	0.85	6
Quality improvement teams	0.84	7
Self-directed work teams	0.83	8
Group decision making	0.82	9
Advisory committees	0.67	10
MAgi =	0.85	

* Based on percentage response scored above median value on the agreement scale.

Table 9.3. Teamwork activities - Relative agreement indices and ranking

Activities	Manufacturing	Rank
Team building	0.94	1
Self-directed work teams	0.92	2*

Table 9.3 contd.

Goal setting	0.92	3
Team meeting	0.91	4*
Co-ordination	0.91	5
Cross-functional teams	0.90	6
Quality improvement teams	0.88	7
Group decision making	0.87	8
Conflict resolution	0.84	9
Advisory committees	0.69	10
MAgi =	0.89	

* Based on percentage response scored above median value on the agreement scale.

Table 10. Organisational hierarchy and relative involvement - Percentage scoring

(>3 on agreement scale)

Levels of organisation	Construction	Manufacturing	Total sample	Median *
Leadership				
Strategic	92.6	92.3	92.4	5
General	77.7	88.5	83.1	4
Operational	74.0	69.2	71.7	4
Direct work	37.0	30.7	33.9	3
Resources development				
Strategic	88.9	88.5	88.6	5
General	77.8	77.0	77.3	4
Operational	70.3	46.1	58.5	4
Direct work	33.3	19.2	26.4	2
Involvement				
Strategic	81.5	80.7	81.1	5
General	88.8	92.3	90.6	4
Operational	81.5	92.3	86.8	5
Direct work	66.6	88.4	77.3	5
Recognition				
Strategic	81.4	69.3	75.5	4
General	77.7	73.1	75.4	4
Operational	88.8	88.5	88.7	4
Direct work	66.6	73.1	69.8	4
Empowerment system				
Strategic	77.8	69.2	73.6	5
General	62.9	73.1	67.9	4
Operational	62.9	73.1	67.9	4
Direct work	44.4	53.8	49	3
Process improvement				
Strategic	70.3	57.7	64.1	4
General	88.8	80.8	84.9	4
Operational	92.6	92.3	92.5	5
Direct work	81.5	88.4	84.9	5
Education and training				
Strategic	85.2	76.9	81.1	5
General	88.9	88.4	88.7	5
Operational	74.1	92.3	83.0	5
Direct work	51.8	88.5	69.8	4
Measurement				
Strategic	74.0	65.4	69.8	4

Table 10 contd.

General	74.0	84.6	79.2	4
Operational	63.0	80.7	71.7	5
Direct work	55.5	76.9	66.0	4
Teamwork				
Strategic	92.6	80.7	86.8	5
General	92.6	84.6	88.7	5
Operational	92.6	92.3	92.5	5
Direct work	88.9	88.5	88.7	5

Table 11. Organisational hierarchy and involvement - Relative involvement indices and ranking

Levels of organisation	Construction	Manufacturing	Total sample	Rank
Leadership				
Strategic	0.94	0.91	0.93	1
General	0.84	0.86	0.85	2
Operational	0.78	0.79	0.79	3
Direct work	0.61	0.64	0.63	4
Resources development				
Strategic	0.88	0.89	0.89	1
General	0.78	0.81	0.80	2
Operational	0.76	0.71	0.74	3
Direct work	0.54	0.53	0.54	4
Involvement				
Strategic	0.85	0.86	0.86	3
General	0.87	0.88	0.87	1*
Operational	0.87	0.88	0.87	2
Direct work	0.80	0.88	0.84	4
Recognition				
Strategic	0.84	0.78	0.81	2
General	0.81	0.79	0.80	3
Operational	0.87	0.84	0.85	1
Direct work	0.76	0.81	0.79	4
Empowerment system				
Strategic	0.83	0.78	0.80	1
General	0.77	0.75	0.76	2
Operational	0.75	0.74	0.75	3
Direct work	0.68	0.67	0.67	4
Process improvement				
Strategic	0.81	0.78	0.80	4
General	0.87	0.83	0.85	3
Operational	0.92	0.91	0.92	1
Direct work	0.87	0.88	0.87	2
Education and training				
Strategic	0.89	0.85	0.87	2
General	0.89	0.85	0.87	1*
Operational	0.85	0.87	0.86	3
Direct work	0.76	0.85	0.81	4
Measurement				
Strategic	0.81	0.80	0.81	3
General	0.78	0.86	0.82	2
Operational	0.81	0.88	0.85	1

Table 11 contd.

Direct work	0.74	0.83	0.78	4
Teamwork				
Strategic	0.93	0.85	0.89	4*
General	0.93	0.86	0.89	3
Operational	0.93	0.91	0.92	1
Direct work	0.90	0.91	0.91	2

* Based on percentage response scored above median value on the agreement scale.

Table12. Analysis of variance of hierachical involvement by sample sub-groups

Organisational hierarchy	Significance (Kruskall-Wallis ANOVA)		
	Construction & Manufacturing	Implementatio-n Group	Awareness group
Leadership			
Strategic	0.65	0.49	0.89
General	0.66	0.03*	0.50
Operational	0.99	0.04*	0.41
Direct work	0.82	0.30	0.77
Resources development			
Strategic	0.40	0.54	0.53
General	0.23	0.34	0.87
Operational	0.25	0.75	0.33
Direct work	0.88	0.53	0.39
Involvement			
Strategic	0.73	0.78	0.29
General	0.49	0.42	0.36
Operational	0.52	0.18	0.58
Direct work	0.14	0.26	0.60
Recognition			
Strategic	0.37	0.27	0.11
General	0.56	0.25	0.33
Operational	0.68	0.48	0.41
Direct work	0.28	0.69	0.35
Empowerment system			
Strategic	0.55	0.23	0.50
General	0.99	0.35	0.43
Operational	0.98	0.93	0.53
Direct work	0.98	0.84	0.83
Process improvement			
Strategic	0.52	0.81	0.81
General	0.49	0.60	0.51
Operational	0.86	0.80	0.20
Direct work	0.49	0.60	0.15
Education and training			
Strategic	0.97	0.96	0.47
General	0.67	0.25	0.78
Operational	0.83	0.48	0.36
Direct work	0.08	0.77	0.34
Measurement			
Strategic	0.89	0.98	0.31
General	0.06	0.02*	0.69
Operational	0.20	0.22	0.47

Table 12 contd.

Direct work	0.12	0.30	0.75
Teamwork			
Strategic	0.25	1.00	0.66
General	0.28	0.44	0.42
Operational	0.70	0.73	0.61
Direct work	0.86	0.90	0.33

Legend:
Implementation group: 1 - Not at all implemented; 2 - 1 to 3 years in implementation; 3 - 3 to 5 years in implementation; and 4 - above 5 years in implementation.
Awareness group: 1 - no awareness on empowerment; 2 - little awareness; 3 - some awareness; 4 - Awareness; and 5 - Full awareness
* - Difference at 0.05 level of significance

Part II

Frequency analysis and medians - current implementation

Table 1. Leadership activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Facilitation	13.2	49.1	37.8	3
Encouragement	15.1	32.1	52.8	4
Management commitment	15.1	47.2	37.7	3
Role model	22.6	41.5	35.9	3
Executives walkthroughs	20.7	34.0	45.2	3
Vision/mission	17.0	34.0	49.0	3
Champions of empowerment	39.6	28.3	32.1	3
Average percentage	20.5	38.0	41.5	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: 3-using averagely, 4-using fully.

Table 2. Resources development activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Funding	11.3	35.8	52.8	4
Working conditions	7.5	26.4	66.1	4
Organisational restructuring	16.9	35.8	47.2	3
Average percentage	11.9	32.7	55.4	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .3-using averagely, 4-using fully.

Table 3. Involvement activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Customer (external) involvement	18.9	24.5	56.6	4
Supplier (external) involvement	24.5	28.3	47.2	3

Table 3 contd.	20.8	32.1	47.1	3
Customer satisfaction				
Employee involvement	18.9	35.8	45.3	3
Employee satisfaction	18.9	54.7	26.4	3
Voluntry participation	35.8	32.1	32.0	3
Grievances filing	11.3	39.6	49.1	3
Average percentage	21.3	35.3	43.4	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .3-using averagely, 4-using fully.

Table 4. Recognition activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Reward system	15.1	47.2	37.7	3
Presentation	43.4	22.6	34.0	3
Award ceremony	39.7	28.3	32.1	3
Average percentage	32.7	32.7	34.6	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .3-using averagely, 4-using fully.

Table 5. Empowerment system activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Quality policy	7.6	20.8	71.7	4
Procedures	11.3	28.3	60.4	4
Roles of employees	39.6	32.1	28.3	3
Empowerment system	58.5	24.5	17.0	2
Empowerment implementation plan	62.2	22.6	15.1	2
Average percentage	35.8	25.7	38.5	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .2-using little, 3-using averagely, 4-using fully.

Table 6. Process improvement activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Two-way communications	18.8	41.5	39.6	3
Process ownership	15.1	32.1	52.8	4
Lowered levels of decision making	22.7	37.7	39.6	3
Problem solving	22.7	30.2	47.2	3
Joint labour/management problem solving process	26.4	20.8	52.8	4
Department improvement plan	15.0	32.1	52.8	4
Quality Function Deployment	37.7	32.1	30.2	3
Jobsite improvement plans	32.1	35.8	32.0	3
Process evaluation	41.5	28.3	30.1	3
Statistical process control	39.7	30.2	30.2	3
Average percentage	27.2	32.1	40.7	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .2-using little, 3-using averagely, 4-using fully.

Table 7. Education and training activities - activities - Percentage scoring of current usage.

Activities	<3	3	>3	Median *
Skill development	17.0	30.2	52.8	4
Training	28.3	24.5	47.1	3
Technical cross-training	28.3	28.3	43.3	3
Display boards	26.4	30.2	43.4	3
Empowerment awareness	39.6	34.0	26.5	3
Skill certification	32.1	26.4	41.5	3
Self-managing training	45.3	41.5	13.2	3
News letters	22.6	20.8	56.6	4
Supplier training	39.6	41.5	18.9	3
Posters	41.5	30.2	28.3	3
Average percentage	32.0	30.8	37.2	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .2-using little, 3-using averagely, 4-using fully.

Table 8. Measurement activities - Percentage scoring of current usage

Activities	<3	3	>3	Median *
Inspection	15.0	34.0	51.0	4
Job performance evaluation	26.5	39.6	33.9	3
Benchmarking	39.6	34.0	26.4	3
Self-assessment of performance	60.3	30.2	9.5	2
Sampling	39.7	39.6	20.8	3
Documentation	56.6	26.4	17.0	2
Diagnostic survey	64.2	18.9	17.0	2
Average percentage	43.1	31.8	25.1	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .2-using little, 3-using averagely, 4-using fully.

Table 9. Teamwork activities - Percentage scoring of current usage.

Activities	<3	3	>3	Median *
Team building	15.1	41.5	43.4	3
Team meetings	17.0	28.3	54.7	4
Co-ordination	18.8	37.7	43.3	3
Goal setting	32.0	32.1	35.9	3
Cross-functional teams	32.0	32.1	35.9	3
Self-directed work teams	15.1	52.8	32.1	3
Quality improvement teams	39.6	32.1	28.3	3
Group decision making	34.0	26.4	39.6	3
Conflict resolution	33.9	32.1	33.9	3
Advisory committees	64.1	22.6	13.2	2
Average percentage	30.2	33.8	36.0	

< 3 - using little (summation of categories 1 & 2 in the usage scale)

> 3 - using fully (summation of categories 4 & 5 in the usage scale)

* Central tendancy: .2-using little, 3-using averagely, 4-using fully.

Relative Usage indices and ranking

Table 10. Leadership activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Facilitation	0.63	0.68	0.65	5*
Encouragement	0.69	0.70	0.69	1*
Management commitment	0.65	0.68	0.66	3
Role model	0.64	0.63	0.64	6
Executives walkthroughs	0.67	0.64	0.65	4*
Vision/mission	0.64	0.73	0.69	2*
Champions of empowerment	0.53	0.61	0.57	7
MAgi =	0.63	0.67	0.65	

* Based on percentage response scored above median value on the agreement scale.

Table 11. Resources development activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Funding	0.73	0.69	0.71	2
Working conditions	0.73	0.77	0.75	1
Organisational restructuring	0.63	0.68	0.66	3
MAgi =	0.70	0.71	0.71	

Table 12. Involvement activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Customer (external) involvement	0.67	0.75	0.71	1
Supplier (external) involvement	0.59	0.77	0.68	3
Customer satisfaction	0.67	0.66	0.67	4*
Employee involvement	0.64	0.69	0.67	5*
Employee satisfaction	0.61	0.65	0.63	6
Voluntry participation	0.54	0.63	0.58	7
Grievances filing	0.67	0.75	0.70	2
MAgi =	0.63	0.70	0.66	

* Based on percentage response scored above median value on the agreement scale.

Table 12.1 Involvement activities - Relative usage indices and ranking

Activities	Construction	Rank
Customer satisfaction	0.67	3*
Supplier (external) involvement	0.59	6
Customer (external) involvement	0.67	1*
Employee involvement	0.64	4
Employee satisfaction	0.61	5
Grievances filing	0.67	2*
Voluntry participation	0.54	7
MAgi =	0.63	

* Based on percentage response scored above median value on the agreement scale.

Table 12.2 Involvement activities - Relative usage indices and ranking

Activities	Manufacturing	Rank
Employee involvement	0.69	4
Customer (external) involvement	0.75	2*
Supplier (external) involvement	0.77	1
Employee satisfaction	0.65	6
Voluntry participation	0.63	7
Customer satisfaction	0.66	5
Grievances filing	0.75	3*
MAgi =	0.70	

* Both percentage response scored above median value on the agreement scale and Agi are same.

Table 13. Recognition activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Reward system	0.64	0.68	0.66	1
Presentation	0.50	0.63	0.57	2*
Award ceremony	0.53	0.61	0.57	3*
MAgi =	0.56	0.64	0.60	

Table 14. Empowerment system activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Quality policy	0.77	0.81	0.79	1
Procedures	0.77	0.73	0.75	2
Roles of employees	0.58	0.56	0.57	3
Empowerment system	0.46	0.48	0.47	4
Empowerment implementation plan	0.46	0.47	0.46	5
MAgi =	0.61	0.61	0.61	

Table 15. Process improvement activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Two-way communications	0.62	0.68	0.65	4
Process ownership	0.63	0.75	0.69	1*
Lowered levels of decision making	0.67	0.62	0.64	
Problem solving	0.59	0.76	0.67	2
Joint labour/management problem solving process	0.59	0.74	0.66	3
Department improvement plan	0.66	0.73	0.69	1*
Quality Function Deployment	0.47	0.68	0.57	6*
Jobsite improvement plans	0.61	0.58	0.59	5
Process evaluation	0.51	0.64	0.57	7
Statistical process control	0.39	0.74	0.56	8
MAgi =	0.57	0.69	0.63	

* Based on percentage response scored above median value on the agreement scale.

**Both percentage response scored above median value on the agreement scale and Agi are same.

Table 15.1. Process improvement activities - Relative usage indices and ranking

Activities	Construction	Rank
Process ownership	0.63	3
Two-way communications	0.62	4
Lowered levels of decision making	0.67	1
Joint labour/management problem solving process	0.59	6*
Department improvement plan	0.66	2
Jobsite improvement plans	0.61	5
Problem solving	0.59	7*
Process evaluation	0.51	8
Quality Function Deployment	0.47	9
Statistical process control	0.39	10
MAgi =	0.57	

Table 15.2. Process improvement activities - Relative usage indices and ranking

Activities	Manufacturing	Rank
Problem solving	0.76	1
Two-way communications	0.68	6*
Lowered levels of decision making	0.62	9
Quality Function Deployment	0.68	7*
Process ownership	0.75	2
Statistical process control	0.74	4*
Joint labour/management problem solving process	0.74	3*
Department improvement plan	0.73	5
Process evaluation	0.64	8
Jobsite improvement plans	0.58	10
MAgi =	0.69	

* Based on percentage response scored above median value on the agreement scale.

Table 16. Education and training activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Skill development	0.64	0.75	0.69	2
Training	0.55	0.73	0.64	3*
Technical cross-training	0.53	0.71	0.62	5
Display boards	0.55	0.75	0.64	4*
Empowerment awareness	0.53	0.60	0.57	8*
Skill certification	0.53	0.68	0.60	6
Self-managing training	0.48	0.56	0.52	10
News letters	0.72	0.68	0.70	1
Supplier training	0.49	0.59	0.54	9
Posters	0.52	0.61	0.57	7*
MAgi =	0.55	0.67	0.61	

* Based on percentage response scored above median value on the agreement scale.

**Both percentage response scored above median value on the agreement scale and Agi are same.

Table 16.1. Education and training activities - Relative usage indices and ranking

Activities	Construction	Rank
Skill development	0.64	2
Empowerment awareness	0.53	7*
Training	0.55	3*
Display boards	0.55	4*
Technical cross-training	0.53	5*
News letters	0.72	1
Skill certification	0.53	6*
Self-managing training	0.48	10
Supplier training	0.49	9
Posters	0.52	8
MAgi =	0.55	

* Based on percentage response scored above median value on the agreement scale.

Table 16.2. Education and training activities - Relative usage indices and ranking

Activities	Manufacturing	Rank
Skill development	0.75	1*
Training	0.73	3
Technical cross-training	0.71	4
Skill certification	0.68	6*
Display boards	0.75	2*
Empowerment awareness	0.60	8
Supplier training	0.59	9
Self-managing training	0.56	10
News letters	0.68	5*
Posters	0.61	7
MAgi =	0.67	

* Based on percentage response scored above median value on the agreement scale.

Table 17. Measurement activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Inspection	0.64	0.78	0.71	1
Job performance evaluation	0.64	0.61	0.62	2
Benchmarking	0.46	0.63	0.54	3*
Self-assessment of performance	0.43	0.46	0.44	6
Sampling	0.47	0.61	0.54	4*
Documentation	0.46	0.49	0.47	5
Diagnostic survey	0.38	0.47	0.43	7
Agi	0.50	0.58	0.53	

* Based on percentage response scored above median value on the agreement scale.

Table 18. Teamwork activities - Relative usage indices and ranking

Activities	Construction	Manufacturing	Total sample	Rank
Team building	0.67	0.67	0.67	2
Team meetings	0.70	0.73	0.72	1
Co-ordination	0.65	0.65	0.65	3
Goal setting	0.55	0.65	0.60	7
Cross-functional teams	0.62	0.62	0.62	5
Self-directed work teams	0.64	0.65	0.64	4
Quality improvement teams	0.52	0.62	0.57	9

Table 18 contd.

Group decision making	0.61	0.61	0.61	6
Conflict resolution	0.60	0.61	0.60	8
Advisory committees	0.38	0.48	0.43	10
MAgi =	0.59	0.63	0.61	

* Based on percentage response scored above median value on the agreement scale.

Table 18.1. Teamwork activities - Relative usage indices and ranking

Activities	Construction	Rank
Team building	0.67	2
Team meeting	0.70	1
Cross-functional teams	0.62	5
Co-ordination	0.65	3
Goal setting	0.55	8
Conflict resolution	0.60	7
Quality improvement teams	0.52	9
Self-directed work teams	0.64	4
Group decision making	0.61	6
Advisory committees	0.38	10
MAgi =	0.59	

* Based on percentage response scored above median value on the agreement scale.

Table 18.2. Teamwork activities - Relative agreement indices and ranking

Activities	Manufacturing	Rank
Team building	0.67	2
Self-directed work teams	0.65	5*
Goal setting	0.65	4*
Team meeting	0.73	1
Co-ordination	0.65	3*
Cross-functional teams	0.62	6*
Quality improvement teams	0.62	7*
Group decision making	0.61	8*
Conflict resolution	0.61	9*
Advisory committees	0.48	10
MAgi =	0.63	

* Based on percentage response scored above median value on the agreement scale.

Part III

Spearman Rank Correlation Between Ranks of "Agreement Indices" and "Usage Indices" of Empowerment Activities

Table 1. Leadership

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Facilitation	0.91	1*	0.67	3	0.93	1	0.70	4
Encouragement	0.91	2*	0.74	1	0.91	2*	0.74	2
Management commitment	0.90	3	0.67	4	0.91	3*	0.71	3
Role model	0.87	5	0.65	5	0.90	4*	0.66	5
Executives walkthroughs	0.88	4	0.63	6	0.86	7	0.65	6
Vision/mission	0.85	6	0.69	2	0.90	5*	0.77	1
Champions of empowerment	0.81	7	0.61	7	0.86	6	0.63	7
Spearman Significance	0.108				0.127			

* Based on percentage frequency

Table 2. Resources development

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Funding	0.86	1*	0.76	1	0.91	1	0.69	3
Working conditions	0.86	2*	0.75	2	0.88	3*	0.77	1
Organisational restructuring	0.81	3	0.68	3	0.88	2*	0.74	2
Spearman Significance	0.00				0.00 (-ve)			

* Based on percentage frequency

Table 3. Involvement

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Customer (external) involvement	0.86	3	0.66	4	0.91	1	0.78	2
Supplier (external) involvement	0.87	2	0.62	5	0.90	3	0.80	1
Customer satisfaction	0.90	1	0.68	1*	0.86	6	0.70	5

Table 3 contd.								
Employee involvement	0.83	4*	0.68	2*	0.91	2	0.74	3
Employee satisfaction	0.83	5*	0.61	6	0.88	4	0.64	7
Voluntry participation	0.80	7	0.60	7	0.87	5	0.67	6
Grievances filing	0.81	6	0.68	3	0.85	7	0.74	4
Spearman Significance	0.090				0.108			

* Based on percentage frequency

Table 4. Recognition

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Reward system	0.90	1	0.63	1	0.88	1	0.70	1
Presentation	0.81	2	0.54	2*	0.84	2	0.66	2
Award ceremony	0.78	3	0.54	3*	0.78	3	0.64	3
Spearman Significance	0.00				0.00			

* Based on percentage frequency

Table 5. Empowerment system

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Quality policy	0.89	1	0.77	2	0.93	1	0.84	1
Procedures	0.86	2	0.80	1	0.83	2	0.74	2
Roles of employees	0.75	4*	0.57	3	0.75	3	0.55	3
Empowerment system	0.75	3*	0.49	5	0.73	4	0.50	4*
Empowerment implementation plan	0.72	5	0.50	4	0.71	5	0.50	5*
Spearman Significance	0.140				0.00			

* Based on percentage frequency

Table 6. Process improvement

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Two-way communications	0.90	2	0.65	5	0.93	2	0.71*	6
Process ownership	0.91	1	0.69	3	0.91	5*	0.78*	1
Lowered levels of decision making	0.89	3	0.73	2	0.92	3*	0.66	8
Problem solving	0.84	7	0.63	7	0.95	1	0.77	4

Table 6 contd. Joint labour/management problem solving process	0.87	4*	0.64	6	0.91	7*	0.78*	2
Department improvement plan	0.87	5*	0.75	1	0.90	8	0.78*	3
Quality Function Deployment	0.78	9	0.47	9	0.92	4	0.71*	7
Jobsite improvement plans	0.85	6	0.66	4	0.83	10	0.59	10
Process evaluation	0.79	8	0.56	8	0.88	9	0.64	9
Statistical process control	0.72	10	0.42	10	0.91	6*	0.75	5
Spearman Significance	0.005				0.255			

* Based on percentage frequency

Table 7. Education and training

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Skill development	0.90	1	0.67	2	0.95	1*	0.78	1*
Training	0.86	3*	0.59	3*	0.95	2*	0.78	2*
Technical cross-training	0.84	5*	0.51	7*	0.92	3	0.74	4
Display boards	0.84	4*	0.55	6	0.88	5*	0.76	3
Empowerment awareness	0.86	2*	0.58	5	0.87	6	0.63	7*
Skill certification	0.82	7	0.59	4*	0.88	4*	0.68	6
Self-managing training	0.81	8*	0.51	8*	0.84	8	0.59	10
News letters	0.83	6	0.75	1	0.83	9	0.73	5
Supplier training	0.81	9*	0.50	9	0.85	7	0.62	9
Posters	0.75	10	0.49	10	0.80	10	0.63	8
Spearman Significance	0.010				0.005			

* Based on percentage frequency

Table 8. Measurement

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Inspection	0.83	3	0.66	1	0.90	1	0.78	1
Job performance evaluation	0.85	1	0.65	2	0.88	2*	0.62	3
Benchmarking	0.84	2	0.46	4*	0.88	3*	0.62	4
Self-assessment of performance	0.81	4	0.46	5*	0.84	4	0.47	7
Sampling	0.73	5*	0.45	6	0.81	5	0.63	2
Documentation	0.73	7*	0.47	3	0.78	6*	0.50	6

Table 8 contd.								
Diagnostic survey	0.73	6*		7	0.78	7*	0.51	5
Spearman Significance	0.127				0.090			

* Based on percentage frequency

Table 9. Teamwork

Activities	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Team building	0.93	1	0.74	1*	0.94	1	0.70	2
Team meetings	0.91	2	0.74	2*	0.91	4*	0.79	1
Co-ordination	0.89	4*	0.68	4*	0.91	5*	0.68	3*
Goal setting	0.87	5	0.58	8	0.92	3*	0.65	6
Cross-functional teams	0.89	3*	0.67	6	0.90	6	0.64	7*
Self-directed work teams	0.83	8	0.69	3	0.92	2*	0.67	5
Quality improvement teams	0.84	7	0.56	9	0.88	7	0.68	4*
Group decision making	0.82	9	0.68	5*	0.87	8	0.64	8*
Conflict resolution	0.85	6	0.65	7	0.84	9	0.61	9
Spearman Significance	0.100				0.030			

* Based on percentage frequency

Table 10. Rank order correlation between overall "Agreement" and "Usage" indices of the empowerment elements

Elements	Construction				Manufacturing			
	Agreement		Usage		Agreement		Usage	
	Indices	Rank	Indices	Rank	Indices	Rank	Indices	Rank
Leadership	0.86	1	0.66	2*	0.90	2	0.69	4*
Teamwork	0.85	2	0.66	3*	0.89	4*	0.67	6*
Resources development	0.84	3*	0.73	1	0.89	3*	0.73	1
Involvement	0.84	4*	0.65	4	0.88	6*	0.72	3*
Process improvement	0.84	5*	0.62	6	0.91	1	0.72	2*
Education and training	0.83	6*	0.57	7*	0.88	5*	0.69	5*
Recognition	0.83	7*	0.57	8*	0.83	8	0.67	7*
Measurement	0.79	8*	0.51	9	0.84	7	0.59	9
Empowerment system	0.79	9*	0.63	5	0.79	9	0.63	8
Spearman Significance	0.006				0.008			

* Based on percentage frequency

Appendix - C

Interview Questions

Interview Questions

Interview date:
Interview time:
Venue:

Name of the respondent:
Job title :
Company name :
Company address :
Telephone No. :

Organisation and general

1. Is the company part of some larger organisation? Yes/No
   If yes, please indicate the name of the holding company.

2. Does the company operate number of subsidiaries or operating units?
   Yes/No
   If yes, how many? What are their functions? and where are they located?

3. Number of employees? (1200 and over, 600-1199, 1-599)

4. How do you classify your employees in terms of four levels of your organisation: direct work; operational; general; and strategic?

5. How do you classify your business functions with respect to four levels of your organisation: direct work; operational; general; and strategic?

6. What are the main areas of activities the company involved in?
   (Building. civil, property development, mining, offshore, building materials, mechanical, electrical engineering, builders merchants etc.)

7. What are the companys turnover from the year 1993 to 1995?

8. Has the company been registered for BS5750 or for anyother quality certification?

9. Do you have separate quality assurance department? If yes what is its role?

10. What would you consider to be the cost of quality (appraisal cost+deviation cost) as a percentage of your company turnover? (1-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%)

11. Do you have any senior person responsible for quality (e.g. Quality Director, Quality Manager etc.) ? If yes, what is his/her role? and to whom does he/she reports?

Leadership

1. What type of leadership styles you adopt? (eg. participative, authoritarian etc.)

2. Do you feel that managers should act as leaders to empower employees and improve business performance?

   If yes, does your managers and staffs act as leaders?

3. Does leadership exist at all levels of the organisation?

4. Who are the leaders of top management including strategic and general levels? and what are their leadership functions?

5. Do you produce vision and mission statements for your business future?

   If yes,
   Who produces them?

   What are the main contents of those statements? (eg. customers and markets, technology, performance, people policy, etc.)

   How it is distributed to the entire organisation?

   Do you expect feedback on those vision from your employees?

   If yes,
   Do you take actions against those feedback?

6. How does the management show its commitment to the desired change and goals of the vision?

   Does top executives walk through the department, site, etc.?

   If yes, executives of what level of your organisation? and what they do during the visit?

7. What are the leadership roles of the top management specific to the implementation of empowerment?

8. How the leaders are assigned at the operational and direct work level? (i.e. on what basis? department wise? section wise? delegated teams?)

   How are they selected? and how long they be leaders?

   Who are the leaders at operational level? and What are the leadership roles at operational level?

   Who are the leaders at direct work level? and What are their leadership roles?

9. Leaders at all levels of the organisation should act as 'role models'. Do you agree with this statement?

10. In the implementation process of empowerment, which level leaders should be 'champions of empowerment'?

11. Do you train employees to act as leaders?

    If yes, what leadership skills you offer them through training? (eg. interpersonal. co-ordination, team building etc.)

12. What leadership skills, in specific, you require for the leaders of top management and lowered levels?

Empowerment policy and system development

1. 1.Does your company has a quality policy? yes/no.
   If yes,
   In which year did this policy begin?
   Is this policy documented? yes/no
   Is this policy distributed to all employees? yes/no
   How it is distributed?

2. Have you implemented TQM? yes/no
   If yes,
   Which year?
   What were the objectives for implementing TQM?
   Have they been achieved successfully?

3. Did your company introduce empowerment policy as a part of TQM/Quality policy or as a separate initiative?

4. Why did the company initially decide on an empowerment policy?
(1.To improve process, 2. Improve quality, 3. Satisfy customer, 4. customer's pressure, 5. Competition, 6. survive, 7. improve skills of employee)

In which year did you prepare empowerment policy?
Is this policy documented? yes/no
How this policy was informed to all employees?
What percentage of employees are aware of and understood the company's commitment to empowerment?

What was the response of your employees when they were informed about implementation of empowerment?(e.g. acceptance, objections, due to mis-understanding, in-difference, and scepticism).

If there were any resistance to implementation, how they were solved?

In which year did empowerment implementation begin?
Has the company appointed external consultants for establishing and implementing empowerment?
Did you find problems such as consultants to understanding your business?

5. Did the empowerment initiative arise from new personnel (e.g. New Chairman, Directors or Consultants)?

6. Did you prepare empowerment implementation plan in specific?

Who was responsible for preparing the plan? (Individuals or teams)

What was the input or involvement of employees at lowered level of your organisation in the establishment of implementation plan?
What time period did the plan span?
Was it followed? Did any changes need to be made? Any recommendations from employees percieved?

How much background work had been spent on the preparation for its implementation? Length of time, Number of personnel, etc.

Have you documented the implementation plan?

7. How was the empowerment programme initially put across to the management and employees? (e.g. What courses, open days?) Any recommendations percieved?

How did the empowerment programme begin? Was there a blaze of publicity on its introduction and a full scale programme introduced or was a pilot project quietly introduced into one department?

How many years did or will it take for the full implementation?

Is it now implemented in all departments?

8. Is there any steering committee -
   Who takes the lead?
   How often does it meet?
   What do they discuss?

   What is its responsibility?

   To whom does it report?

9. Who is at the head of the implementation of empowerment process?

   What is his/her role?

   To whom he/she reports?

10 How committed is the MD or senior management to empowerment?

   Do they view it as an axtra burden?

11. As part of the implementation process, did you produce procedures and work instructions manuals?

   Have they been documented?

12. How the relationships between superordinate and sub-ordinate (al all levels) were changed to support the implementation of empowerment?

   How the roles of employees at Direct Work were reorganised? (e.g. interms of teamwork, cross-functional, etc.)

Has management/superior/employees attitude changed since implementation?

13. Are there any organisational characteristics that affected the implementation process as a whole or specific implementation activity? (e.g. employee size, turnover, method of construction, type of project etc.)

14. What is your organisational structure (please map, needs to include from chairman to operatives including all departments) before and after the implementation of empowerment?

Resources development

1. What are the fundamental resources that the company prioritised as necessary for the implementation of empowerment? (eg. organisational restructuring, funding, etc.)

2. Who were the key participants involved in resources development activities?

3. Was there any formal committee set up for the resources development? (eg. reengineering committee)

   If yes, what were the specific roles of that committee?

   To whom it had to report?

   How long has the committee existed? and When was it dissolved?

4. Did the company restructured its organisation?
   If yes,
   Why it intended to change the structure?

   Who played the key role in this process?

   To whom he/she had to report?

   Did you appoint any external consultants for this restructuring?

5. What were the problems of the old organisational structure?

6. When designing new structure, what were the main criteria taken into consideration? (eg. process improvement, empowerment etc.)

7. What were the empowerment criteria considered during the reorganisation? (eg. self-managed work teams, cross-functional teams etc.)

8. Did you or will you reorganise your business process?

   If yes,
   Which should be addressed first? whether, organisation or process? and why?

9. Did the restructuring process continue (after it's completion) during the course of implementation?

10. What were the inputs of the middle level and lower level employees in the reengineering process?

    What information (or data) were sought from them for the reengineering process?

    What were their predominant attitudes to reorganisation?
    (eg. accepted, objection, scepticism etc.)

11. Initially, to what extent the restructuring was planned? organisation wide or particular department?

    If it is particular department, why? and what was the result?

    Over what period of time was the organisation-wide restructuring implemented?

12. As part of the resources development process, did you provide any additional facilities to employees? (eg. canteen, recreation centre, etc.)

13. In particular, what measures were taken to provide good working conditions to employees at direct work?

14. Did you undertake any physical redesign of offices or plants in order to improve communications and working atmosphere?

    If yes,
    Who, first identified the need? and reported to whom?

    Who had to sanction those provisions?

15. Did you install any computer oriented information technology to improve communications?

    If yes,
    How it was designed?

    Did you use external consultants?

    Was it implemented partly or throughout the organisation?

16. Empowerment exerts considerable investment for resources devlopment including awareness, training etc., What was the source for these investments?

Which department estimated these amounts?

Who had the authority to sanction?

17. Is there any fund allocated to any department or teams/individual to use for implementation or business related activities (eg. visiting customer/supplier premises) without approval by top management? Give me an example.

If yes,
What is the limit?

For what purposes?

18. In empowerment, employees need to understand the financial implications of their decisions, otherwise they might not understand the cost of their business decision, and consequently, there may be a problem of cost overrun.
What solution you have in your organisation for this problem?

19. Do you require employees to submit the cost-effectiveness of their proposed decisions?

If yes, Is it applicable to employees at all levels? and How the employees of 'direct work' perform these operation?

Who approves the extra cost required for their decisions to be implemented?

Involvement

1. What strategy did you adopt to involve employees in the empowerment programme? (eg. voluntary participation or dictated by top management)

2. If it is dictated by the management,
Who decided it, and how it was conveyed to employees?

Who monitors the involvement activities? and whom he/she has to report?

3. Did you start involving certain groups of employees or the whole organisation?

How long did it take to involve the whole organisation?

4. If it is voluntary participation,
Why did you choose this option? and how it was conveyed to employees?

Who monitors the vountary participation, and whom he/she has to report?

How was the response of employees to the voluntary participation?

5. Do you normally request employees to report their grievances if they have any?

   If yes,
   Whom they have to report? and by what format? (eg. paper or informal)

   How the grievances are analysed and rectified?
   (Is it solved by immediate supervisor or by the top management?)

6. Do you assess employee satisfaction on the job?

   If yes,
   How do you collect data? (eg. questionnaire, personal contact etc.)

   Who is responsible to perform this duty? and whom he/she has to report?

   Do you inform back to employees on the analysis of satisfaction?

7. Do you maintain a list of permanent customers?

8. How do you involve customers in your business?

   Do you inform them your decision of implementation of new management strategies including TQM, empowerment etc.?

   If yes, what reaction did you receive from them?

   Do you inform them of your organisational changes, if any?

   Do you visit customer's premises or attend their conferences to percieve their expectations?

   Do you conduct any questionnaire survey, telephone survey, or seminar to asses your customers' satisfaction and expectations?

   Do you inform your employees your customers' expectation and satisfaction?

   Usually, who in your organisation undertakes all of the above dealings with your customers?

9. Do you maintain a list of favourable suppliers or sub-contractors?

10. How do you involve your supplier or sub-contractors in your (empowerment) system?

When did you inform them your decision on empowerment implementation? (eg. after full implementation, when you decided to implement etc.)

Do you request them to implement empowerment or quality policy in their organisation?

Do you request them to participate in your conferences or meetings?

Do you assist them to develop their business process?

Who in your organisation are involved in all of the above dealings with suppliers? explain their roles? (functional responsibility, reporting procedure etc.)

11 How do you inform your expectations and satisfaction to your suppliers or sub-contractors? (eg. conduct meetings or questionnaire etc.)

How often you convey (update) your expectations to them?

12. Do you assess your suppliers (sub-contractors) organisation on their management capability to supply quality products/services?

If yes, how do you assess?

Who perform this duty?

Whom he/she reports?

13. Do you assess your suppliers' satisfaction on your performance? How?

Recognition

1. What are the most important recognition activities do you adopt to recognise employees performance or achievements?

2. What kind of achievements do you recognise? (please mention separately for various categories of your employees, e.g. operatives, supervisor, managers, etc.)

3. In particular, how do you recognise your lowest level employees? From whom they recieve recognition for their best performance?

4. Do you maintain a reward system?

If yes,

What kind of reward (finance, prices etc.) you offer? and for what purposes or achievements?

Who reports the achievements? and to whom?

Who decides such achievements for reward?

How do you accomplish the process of reward? (eg. meeting? who organise? who presents such reward?)

5. Do you conduct award ceremony for achievements by individuals or teams?

If yes,
At what levels of the organisation?

Who reports the achievements eligible for a ceremony? and to whom?

Who decides such achievements for ceremony?

Who organise the ceremony?

What kind of award you offer in the ceremony?

Who attend the ceremony?

6. If you conduct 'presentations', for what kind of accomplishments you use?

Who organises the presentation meetings?

Who attend the presentation?

7. How do you recognise the best performances of your supplier or sub-contractors?

Process Improvement

1. How did you empower employees to own their processes they control?

Was there any special programme or method adopted to make employees owners of their processes?

How was the decision of process ownership conveyed to employees?

2. Which one would best suit your organisation?
i) process ownership for teams; ii) process ownership for individuals; iii) both

Why have you adopted particular approaches?

If it is individuals' ownership, how do individuals contribute to improvement of relevant processes other than they responsible for?

If it is team's ownership, who takes the lead? Explain with reference to processes of both operational and direct work level?

What kind processes are allotted to own by teams? (eg. processes that cover many interdisciplinary functions)

3. To what extent do you empower employees to take decisions related to their business processes?

Do you set any limit or restrictions to employees in taking such decisions? what are they?

What are all the possible areas within which can they take decisions? or Under what circumstances you allow them to take decisions on their own? (explain in specific to employees of operational and direct work)

4. What are the major criteria you require them to consider when they change or improve their processes? (specific to operational and direct work)

5. If employees of operational and direct work have to change their processes for improvement, whom should they contact for advice and for approval? Explain the procedure?

6. How their business processes are being analysed and evaluated for improvements?

Do you require any formal evaluation (feasibility) report from the process owner?

What are all the tools and techniques they use to evaluate the validity of the process? (eg. SPC).

7. How do you solve problems if any arise at direct work level? (eg. reduce waste, employees turnover, accidents etc.)

What are the roles of both top management (possibly operational) and direct work in solving those problems?

If there are any problems at higher levels of the organisation (eg. company's strategic directions) how do you incorporate the lower levels of the organisation in solving them?

8. What are all the tools and techniques your employees use in solving problems? (eg. SPC, QFD etc)

In specific, what tools the operational and direct work employees use for problem solving?

9. Do you use Quality Function Deployment? and for what purposes? who use this tool?

10. Do you produce plans specific to improve department level performance?

If yes,
What departments produce these plans?

Who is responsible for this plan in that department? and who are the key players? and what are their roles?

What are the roles of d'irect work' level employees in developing such plans?

Who approves these plans?

How do they deploy the plan throughout the department?

How often they produce plans for improvement?

11. What are all the measures you take to improve performance/processes at jobsite (direct work level)?

12. Do you prepare jobsite improvement plans?

If yes,
Who is responsible for it? and who are all the possible participants for developing the plan?

How do you deploy the plan at jobsite?

Education and training

1. What is your major training strategy/
   (Skill based, activity based, or both)

2. Do you have any separate training department?
   If yes, Who are the members of the department? and What are their roles?

3. Do you appoint consultants for training your staffs?

If yes, for what major purposes or training activities do you appoint them? and What are their roles?

4. Does the whole organisation, including strategic, general, operational, and direct work, recieve training?

5. What type of training do they recieve? (Mention specific to each level: startegic, general, operational, and direct work).

6. How are the training needs of those levels of organisation diagnosed? and Who diagnoses them?

7. Does the training needs aim to develop employees to acheive the vision and mission of the organisation? or does they involve to achieve any other organisational or business factors?

8. How do you educate and train employees once the needs have been identified? Explain the process? Who is reponsible for training the employees?

9. State which method you adopt, whether group-training or individual-training? and why?

10. Where do you conduct training for employees of direct work? Jobsite (on the spot) or at some formal place?

    Who is responsible for training them?

11. How do you transfer the learned skill or knowledge to the work place? Do you follow any specific procedure? What is the role of top management in this process?

12. How do you evaluate the effects of training?

    Who perform the evaluation?

    How do you distribute the results of the evaluation?

    What measures do you take when you find the results of evaluation unsatisfactory?

    How do you recognise the best learner?

    Do you certify employees who have acquired sufficient skill through the training?

13. How do you impart multidisciplinary skills to employees?

    Do you conduct technical cross-training? How do you accomplish this?

14 How do you continuously track the training needs for employees?

15. How do you train and educate employees specific to quality and empowerment policy and procedures?

Who conducts these training?

What time span these trainings last?

What tools you use to convey the awareness on empowerment and quality to employees? (e.g. display boards, posters, news letters).

Who is responsible for these activities?

16. Do you require employees to manage their training continuously after acquiring sufficient skill and knowledge?

If yes,
Do they manage on individual basis or team basis?

How do they report their progress to the company?and to whom they have to report?

16. Do you assist in training your supplier or sub-contractors organisation?

If yes,
What type of training you offer to them? (eg. quality policy, empowerment, procedures etc)

Who, from your organisation, involves in training them?

How do they report you on their training effects?

Measurement

1. Do you have a formal measurement system for business/process improvement?

If yes,
Who designed that system? and who approved the system?

What are all the components (measurement criteria) of that system? and how the system works? explain it?

2. If you do not have a formal measurement system, then how do you measure your progress?

3.What are all the performance measurements measured by top management? and to what factors are those measures compared? (eg. overall business goal etc.),

Who, in particular perform the above measures? and to whom they have to report?

4. What are all the performance measurements measured by both the operational and direct work employees? and to what factors are those measures compared? (eg. time, work in progress, waste etc.)

Who, in particular perform the above measures? and to whom they have to report?

5. How do you evaluate the performance of employees of direct work on their related job? (eg. product/service deficiencies, skill improvemen, productivy etc.)

Who performs these evaluations? and to whom has to report?

What are the possible tools you use to collect data and evaluate? (documentation, SPC, etc.)

What further actions you take against results of the evaluation?

6. Do you require employees of operational and direct work level to assess their performance themselves?

If yes,
Who sets the performance criteria to measure? top management or employees themselves?

Give some examples of the performance criteria against which they measure?

What are the possible tools they use to collect and evaluate data? (documentation, SPC, etc.)

7. Did you perform diagnostic survey to assess the organisation's readiness to implement empowerment?

If yes,

By what format? (eg. questionnaire survey, interviews, other documents etc.)

Who performed it? and reported to whom?

What was the result of the assessment?

8. Do you benchmark your company's performance against others?
If yes,

What are the criteria you benchmark against others?

Who perfoms it? and report to whom?

What actions you take against the result?

9. Do you maintain a formal documentation system to assess the performance?

If yes,

Does it exist at all levels of the organisation?

For what purpose you mainly use the documentation?

How do you dispose the documents? and after what period you dispose?

Teamwork

1. Do you adopt teamwork at all levels of the organisation? or at particular levels?

If it is particular levels, why?

2. If you have teams at top levels of the management(strategic level), what are they? (eg. Steering committee).

How such teams are built? (i.e. key organisers of the team, organisation procedure, members of the team, size of the team, team approval, temporary or permanent teams, etc.)

How these teams work? (i.e. members role, problem identification, problem solving, meetings procedure, leaders' role etc.)

3. What type of teams you have at the middle levels of the organisation (i.e. general and operational levels?

How these teams are built? (i.e. organiser, members, size, permanent or temporary teams? etc.)

How leaders are selected? and who are the leaders?

What are the specific responsibilities and roles of these teams?

To whom these teams report?
How these teams set goals? (short term? or long term?)

Does direct work employees represent these teams?

If yes, for what purpose? and what are their roles?

4. What type of teams you have at Direct Work-level? (eg. Self Directed Work Teams, Cross-functional teams, work teams etc.)

How these teams are built? (eg. who is responsible for team building? who are all the possible key participants? responsibilities of these teams?

6. Does these teams form around a cluster of interdependent jobs? (illustrate with examples)

What are their important activities?

7. How leaders are selected? and how often?

What are the roles of leaders and members?

8. How does these teams set goals? (short term? or long term?)

9. How these teams work together? (eg. meeting procedures, facilitation, co-ordination, problem solving etc.)

10. To whom these teams report?

11. If you have self-directed work teams, how they are organised? and on what duration? (eg. the four stages of the organisation: start-up, state of confusion, leader centered teams, and tightly formed teams; and members and size of teams, organisers etc.)

These teams organised around segment of work? or processes?

How long it takes to reach the stage of self-direction?

What are the responsibilities of these teams?

How responsibilities are shared among members? (illustrate with examples)

How leaders are selected? and how often?

What are the responsibilities of leaders?

How these teams work? (eg. meeting, problem solving, facilitation etc.)
How these teams arrive on decisions?

To whom these teams report? and what they report?

12. What are the inputs of supervisors or operational level employees to these teams?

In specific, what are the roles of management in these low level teams?

13. Do you have any Joint labour/management teams? what are they?

What are their roles?

How these teams work? (eg. meetings, co-ordination, reporting procedure, documentation, problem solving etc.)

General

In essence, how do you link the sequence of the nine elements (leadership, resources development, involvement, recognition, empowerment system, process improvement, education and training, measurement, and teamwork) in the implementation process of empowerment?

Current performance

1. Since the introduction of empowerment policy, has the company:

Y-Yes N-No DK-Do not Know

i. Increased its market share generally: Y N DK
ii. Increased its market share in specific areas Y N DK
iii. Increased its turnover generally Y N DK
If yes, increased by 1-10%, 11-30%, 31-60%, 61-100%, and above 100%
iv. Profitability Y N DK

2. Since the introduction of empowerment policy, have the company's quality costs:
i. Decreased by 1-5%; ii. decreased by 6-15%, iii. decreased by 16-25%, iv. 26-35%.

3. . Since the introduction of empowerment policy, has the company reduced:
Y-Yes N-No DK-Do not Know

Construction time	Y	N	DK
Rework	Y	N	DK
Material waste	Y	N	DK
Construction changes	Y	N	DK

(by contractor)

Hazards	Y	N	DK

4. Since the introduction of empowerment policy, has the company increased:
Y-Yes N-No DK-Do not Know

Quality of the service/product generally	Y	N	DK
Working to schedule	Y	N	DK
Productivity of employees	Y	N	DK

5. Since the introduction of empowerment policy, has the company achieved:
Y-Yes N-No DK-Do not Know

Increased skill of employees	Y	N	DK
Increased employee satisfaction	Y	N	DK
Increased communication among employees	Y	N	DK
Reduced employees turnover	Y	N	DK
Reduced accidents at site	Y	N	DK

6. Since the introduction of empowerment policy, has the company achieved:
Y-Yes N-No DK-Do not Know

New customer base	Y	N	DK
Reduced customer complaints	Y	N	DK
Increased communication with customer/supplier	Y	N	DK
Increased customer satisfaction	Y	N	DK

Interviewed by:
L. Jawahar Nesan
School of Engineering and the Built Environment
University of Wolverhampton
Wulfruna St.
Wolverhampton
UK - WV1 1SB

Appendix - D

360o Feedback for Colleagues

360o Feedback for Colleagues

Name: Employee

Respondents Name: .....

How to complete the questionnaire

Your response to this questionnaire, in conjunction with the responses from our colleagues both in and out of Company-B, is intended to provide the above person with feedback on some aspects of his performance and behaviour. The feedback will enable him identify his strengths and areas for improvement.

The questions are written down in the form of a statement. All you have to do is place a tick in one of the corresponding boxes indicating to what extent the statement applies to him.

The seven point rating scale is as follows:

6.	5.	4.	3.	2.	1.	0.
Very true of him		Neutral				Not at all true of him

If you would like to be identified against your comments, please write your name at the top of the page where indicated. *If you would prefer to remain anonymous, leave the space blank and your comments will be held in strict confidence.*

Try to make full of the rating scales. Be honest! Make sure his way of being really stands out. Only answer a question *neutral* if you really don't believe you can comment.

The final section of this appraisal is a summary of his acheivements and improvement areas. It may cover items you wish to further highlight or discuss.

Thank you for your help & co-operation.

'The world is perishing for a lack of those brave enough to tell us the truth'

Questionnaire for Colleagues

	6. Very true of him	5.	4.	3. Neutral	2.	1.	0. Not at all true of him
He . . .							
communicates clearly and effectively.	6	5	4	3	2	1	0
gives empowering feedback.	6	5	4	3	2	1	0
gives praise.	6	5	4	3	2	1	0
values others opinions and contribution.	6	5	4	3	2	1	0
thinks ahead and plans accordingly.	6	5	4	3	2	1	0
helps others to learn.	6	5	4	3	2	1	0
is well organised.	6	5	4	3	2	1	0
acknowledges his failings.	6	5	4	3	2	1	0
helps others to achieve their goals and be successful.	6	5	4	3	2	1	0
involves those affected by his decisions.	6	5	4	3	2	1	0
listens to what others have to say.	6	5	4	3	2	1	0
is impeccable.	6	5	4	3	2	1	0
deals with people fairly and consistently.	6	5	4	3	2	1	0
is trustworthy, open & deals honestly with people.	6	5	4	3	2	1	0
makes time for others.	6	5	4	3	2	1	0
creates an environment that is motivating.	6	5	4	3	2	1	0
asks others "how am I doing?"	6	5	4	3	2	1	0
takes responsibility for, and ownership of his development.	6	5	4	3	2	1	0
has a positive outlook to change.	6	5	4	3	2	1	0
builds good relationships.	6	5	4	3	2	1	0
is committed to doing the job 'right first time'.	6	5	4	3	2	1	0

seeks to understand the needs of external colleagues.	6	5	4	3	2	1	0
represents the value of Company-B.	6	5	4	3	2	1	0
views/uses mistakes as a learning opportunity.	6	5	4	3	2	1	0
is technically competent.	6	5	4	3	2	1	0
demonstrates a commitment to improving himself & his tasks	6	5	4	3	2	1	0
contributes innovation.	6	5	4	3	2	1	0
plays an active part in teamwork & teambuilding.	6	5	4	3	2	1	0
is commercially aware.	6	5	4	3	2	1	0
delivers what external colleagues specify.	6	5	4	3	2	1	0
comes up with ideas.	6	5	4	3	2	1	0
offers solutions to problems.	6	5	4	3	2	1	0
achieves a balance between his work and free time.	6	5	4	3	2	1	0

To Summarise:

(In this summary please try to use statements or sentences and avoid one word responses).

What he has acheived or did with greatest effect during the period is.....

He could improve his performance by .....

Please return to:

Address

360º Feedback - External Colleagues Guidance

Company - B is committed to acheiving "Total Client Satisfaction".

We understand this will only come about through our people developing relationships based on trust, integrity and open communication.

It is therefore, essential that our people measure their performance and relationships with our clients, suppliers, customers and sub-contractors on a regular basis.

The person named below, has requested your feedback in order to gain a wide view of performance and make positive efforts to improve.

Your feedback will be held in strict confidence, unless you request otherwise. The comments you make will be transferred to type and the original destroyed.

A pre-paid envelope is enclosed for your reply.

If you have any queries please contact the Culture & Learning Manager on Tel:.....

Thank you for your time and assistance.

(Person requesting feedback - name of the employee).

Appendix - E

Feasibility Report

A Generic Model for Effective Empowerment Implementation in Construction Organisations

(Proposal document for evaluation of feasibility of the model)

Researcher

L. Jawahar Nesan

Research Supervisors

Dr. Gary D Holt

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(Tel: 01902 322286 or 01902 322263)

About the Report

The main aim of this research was to devise a methodology which can offer a most effective empowerment implementation programme to a construction organisation. In the wake of achieving this objective, as a preliminary investigation, the research had conducted a questionnaire survey with UK construction organisations in the middle of last year (1996). The results of the survey analysis were already distributed to you last year. Following the questionnaire survey, detailed case studies were performed on three major construction organisations who have implemented empowerment. Based on these case studies, a generic Data Flow Diagram (DFD) was developed for effective implementation of empowerment within construction organisations.

Having presented the generic DFD model for implementation of empowerment in construction organisations (see Appendix), this report aims to assess the feasibility (including technical, economic, and operational feasibility) of the model by seeking opinions from experts (you). The *proposals* of the generic model along with their relevant *feasibility aspects* are presented in this document. Respondents are requested to evaluate the proposals by appropriately ticking boxes provided against them. Comments on various issues related to the deployment of these proposals are also invited.

It should be borne in mind that this model has several limitations. They are: it was developed from the background of large construction companies having several operating units; it considered only the permanent staff within construction (contractor) companies, (direct site labour was not included); and company's project level dealings with other project participants such as clients, sub-contractors, and suppliers were not included. The model is designed to be deployed within an individual construction (contractor) organisation.

Information supplied by you will be treated in the strictest confidence. Please return the completed document to the following address:

L. Jawahar Nesan
School of Engineering and the Built Environment
University of Wolverhampton
Wulfruna Street
Wolverhampton
West Midlands, WV1 1SB
Tel: 01902 322286; Fax: 01902 322680

Thank you for your time and co-operation

Company's Profile

Please complete the following details of your company.

Respondent's name and designation (optional):

Company's name and address:

Tel:

Company's annual turnover (£Million):

Approximately how many people does your company employ?

Does your company presently employ direct site labour? Yes/No

Does your company presently have operating units (or regional offices) at several locations? Yes/No

If yes, please mention the locations:

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1 Definition of empowerment

2 Introduction

3 Outline of the study

4 Evaluation of proposals of empowerment implementation

4.1 Preparation phase

4.1.1 Evaluation of the preparation phase

4.2 Implementation phase

4.2.1 Evaluation of the Implementation phase

4.3 Sustaining phase

4.3.1 Evaluation of the sustaining phase

Appendix: A generic model of empowerment implementation

Section A - Preparation phase

Section B - Implementation phase

Section C - Sustaining phase

1 DEFINITION OF EMPOWERMENT

This research formally adopted the following definition of empowerment:

A process of enhancing feelings of self-efficacy among organisational members through the identification of conditions that foster powerlessness and through their removal by both formal organisational practices and informal techniques of providing efficacy information.

2 INTRODUCTION

Construction (contractor) organisations are perceived as being influenced by three major factors (environmental, technological, and psycho-social), which can cause unprecedented problems such as sudden market recession (both domestically and internationally), continually changing demands of customers, increased competition and so on. To efficiently address these changing trends, continuous improvements in both 'people' and 'process' are recently advocated. Both *people* and *process* elements are interrelated; poor performance of the one impedes improvement of the other. These two elements link to productivity in such a way that the improvement of productivity lies in the structure of the process itself. Conversely, improvement of the process lies in the hands of employees (people); this seeks employees to be empowered in improving their processes themselves. The above definition shows that, employee empowerment not only encourages participation in decision making and delegating (them) to be responsible for the improvement of their processes, but also, enhancing a feeling of self-efficacy. This, consequently, requires reorganisation of the social system of a construction organisation. This, in turn, emphasises: a reasonably flatter organisational structure; employees to be continuously trained or educated for changing demands in skill; participative leadership styles; two way communication systems; and recognition of achievements.

Having recognised the above, this research identified the following objectives:

- To ascertain and assess the characteristics of new leadership styles that encourage employees to manage their own work
- To develop an empowerment model so as to assist effective implementation of the concept within construction organisations

- To develop a best practice framework for the training and management of the social system of construction (contractor) organisations, taking into account the management of change and empowerment

3. OUTLINE OF THE STUDY

To achieve its objectives, the research consisted four phases: detailed literature review; postal questionnaire survey; case studies of selected companies who have implemented empowerment; and validation.

Initially, review of the literature identified sixty-two empowerment activities under nine major elements. These elements are leadership, empowerment system, resource development, involvement, education and training, process improvement, teamwork, measurement, and recognition. To test the applicability of these activities, a structured postal questionnaire survey was conducted amongst both manufacturing and construction organisations. The manufacturing sample was included because the identification and development of activities was primarily based upon that sector. The results of survey analysis revealed a demonstrable coincidence between the findings of the literature review and their empirical applications to construction organisations. In essence, the findings indicated that sixty-one out of the total sixty-two activities are critical for effective implementation of empowerment in construction organisations.

Having confirmed the criticality of empowerment activities, they were further investigated in detail as to: how they can be efficiently used in construction organisations; and performed by whom and to what extent. These were investigated in three major construction companies who had pioneered the implementation of empowerment. The three companies are large companies having several operating units both in the UK and abroad. Total employee size of these companies is approximately 2000. At the time of undertaking the study, these companies did not directly employ skilled labour. They largely relied on sub-contractors for site works.

Data obtained from the case studies were analysed using several techniques, predominantly, Data Flow Diagram (DFD) techniques. The DFD was used for the following reasons: it is simple, graphical, and multidimensional; efficiently maps processes/activities and their linkages; hierarchical modelling allows one to analyse the

primitive functions of a system; and the information flows of the model can be used to identify the efficacy information required for empowerment implementation. The analysis of case study data resulted in a generic DFD model for effectively implementing empowerment in construction organisations. The model and its descriptions can be seen in the Appendix.

4 EVALUATION OF PROPOSALS OF EMPOWERMENT IMPLEMENTATION

Implementation of empowerment in construction organisations comprised of three major phases: the preparation phase; the implementation phase; and the sustaining phase. In the preparation phase, company's future directions and goals are established, and subsequently, necessary resources required for the achievement of those goals are identified. This includes four key tasks: development of company level vision; development of appropriate quality and employee (empowerment) policy; development of implementation plans for implementing the policy; and development of appropriate resources (see Figures 1 and 2).

During the implementation phase, suitable strategies are adopted to involve employees in the change process, and make them continuously acquire sufficient skills and knowledge to act as empowered employees. These include: initial training to make employees aware of empowerment and related principles; training them on problem solving techniques and teamwork principles; encourage employees to voluntarily be involved in the change process; continuously train and educate employees regarding their business related activities; continuously assess employee attitudes including satisfaction and grievances towards change; and solving their grievances once they are perceived. It can be seen that both the preparation and implementation phases seek full commitment and involvement by both senior and middle management in providing a suitable environment for employees to adopt empowerment. (See Figures 3 and 4)

In the sustaining phase, sufficiently skilled employees act as empowered individuals. In addition to their own process level problems, they incorporate both company level problems and improvement plans at their own business level and continuously strive for improvements in their processes. This includes continuous improvement in skills by continuously identifying their deficiencies in business related skills, and subsequent

learning. This indicates that the whole organisation becomes a learning organisation. The effects of both learning and improvement plans applied to the business are measured at all levels of the organisation. Continuously, best performers are recognised. (See Figures 5 to 8)

In essence, the model indicates that empowerment of employees is not a distinct issue to be dealt with in isolation, rather, it seeks several inputs from both individuals and management (for effective implementation). Involvement of senior management in developing a company vision and associated policies is important because, without such, empowered individuals will have no common goals to strive for. Provision of a suitable environment including, access to resources, continuous training, and partnership between management and individuals, is crucial. Without these characteristics, empowered individuals will face problems such as: inefficient performance due to lack of sufficient resources; incompetence due to lack of sufficient skills; rework and errors due to lack of participation and lack of sharing of knowledge and ideas between management and individuals.

4.1 Preparation phase

The senior management, i.e. company's Main Board along with other senior staff play a crucial role in the earlier stage of implementation. This includes development of company vision, policies, implementation plans, and necessary resources for the implementation of empowerment. Regional level management participates in these processes and assists senior management by providing necessary data and suggestions for improvements. Similarly, employees are encouraged to make suggestions and ideas for improvements. This enables employees to be well aware of company's business goals and policies at the very outset of implementation.

Resources development is one of the crucial processes for employee empowerment. Employees report their resources requirements to either regional management or immediate supervisors. Minor resource requirements are analysed and provided by at regional level whilst major resources are proposed to the Main Boards. All proposals seeking resources must be accompanied by a cost benefit analysis. This exercise (cost benefit analysis) can be performed by employees (assisted by the finance department), which would enable them to understand the cost implications of their needs. However, it may be an over burden for employees at lower levels. Therefore, if it is performed by

respective senior and middle management (with the assistance of the finance department), then it would free employees to concentrate on improvement of their own processes.

To assess the organisation's readiness to implement empowerment, organisational capabilities (i.e. fund, organisational structure, employees' attitudes) for implementing empowerment should be diagnosed. See Appendix (Figures 1 and 2) for DFD of the preparation phase.

4.1.1 Evaluation of the preparation phase

Based on the above discussion (of the DFD model of the preparation phase), the following proposals for the preparation phase are presented for your evaluation.

(Please tick appropriately and comment in the space provided)

- **Senior management develops company level vision and policies and seeks suggestions/comments from employees over them.**
- **Middle management becomes involved in the development of vision and policies, and is encouraged to develop middle level visions for improvements.**
- **Depending on the availability of in-house expertise, external consultants may be appointed for advice in the development of company policies.**
- **Senior management diagnoses organisational capabilities (including organisational structure, employees' attitudes and skills) for implementing empowerment.**
- **Based on the assessment of organisational capability, vision and policy, senior management produces an implementation strategy and plan (including procedures and roles) with the assistance of middle management.**
- **All levels of the organisation, including senior management, middle management, and employees, identify resources. Respective middle management along with senior management evaluate the benefits of those resources (with the assistance of the finance department) and provide them to employees.**

<u>Senior management involvement</u>

	Yes	Not certain	No
Radical changes in the current role of senior management are required to perform the above duties.	☐	☐	☐
The above duties are burdensome for senior management	☐	☐	☐
The above involvement of senior management is critical for the effective implementation of empowerment.	☐	☐	☐
Time is available for senior management to perform the above duties.	☐	☐	☐

Participation by both middle management and employees is sought in the development of vision, policies and implementation plan.

	Yes	Not certain	No
The above participation has the advantage of offering knowledge to employees on company's vision and policies at the early stage of implementation.	☐	☐	☐
The above has advantage of having input from employees for the development of appropriate vision, policies and plans.	☐	☐	☐

The preparation phase emphasises teamwork between senior management and middle management in the development of vision, policies and plans. Construction companies usually have regional management located at different regions. In this case:

	Yes	Not certain	No
Communication among them will be an impediment to adopt teamwork	☐	☐	☐
If yes, provision of such communication facilities will be costly.	☐	☐	☐
Costly, but necessary when compared to long term benefits.	☐	☐	☐
Consulting mechanism between senior and middle management will incur high cost and time.	☐	☐	☐

Paper work

The proposals of the preparation phase require:

	Yes	Not certain	No
A lot of paper work	☐	☐	☐
A lot of paper work, but necessary	☐	☐	☐
Not much paper work, because this can be avoided by informal communications	☐	☐	☐

Manpower requirement

The proposals of the preparation phase:

	Yes	Not certain	No
Require extra manpower	☐	☐	☐
Can be tackled by existing staff	☐	☐	☐
Require staff re deployment	☐	☐	☐
Require external appointments (consultants)	☐	☐	☐

Comments on the preparation phase:

(Please continue on a separate sheet if required)

4.2 Implementation phase

Actual implementation comprises two major processes. First, initial training, where both middle management and employees are trained (or educated) on empowerment, teamwork principles and problem solving techniques. Second, committed employees are continuously trained on their business related skills. During the course of training, successful performers, who have acquired sufficient knowledge and skills to perform their jobs independently (with less or no supervision) are certified. Senior management conducts these initial training sessions. Initial training to all employees rather than selected ones is important because it reduces scepticism among, and increases motivation of, employees to adopt empowerment. After this training, regional management and employees are encouraged to voluntarily adopt empowerment. After individuals' commitment to empowerment, Personnel Development Folders are established for each of them by their immediate supervisors. Employees' performance improvements, skill developments and other details of progress are observed by supervisors and recorded in the folder for future reference. However, before authorisation of employees acting as empowered individuals, continuous exercise of this task would enable both the management and individuals to continuously track the skill deficiencies of employees and take appropriate remedial actions for improvement.

Continuous training is the core issue during implementation. The training process starts with first identifying training needs for every individual, followed by preparing training schedules and topics and arranging training. Finally, training effects are monitored by observing performance at work. Training needs of individuals are identified jointly by both supervisors and employees. Then, the Personnel Department (Training Department) is responsible for arranging training to employees. The trainers are selected by the personnel department directly from employees as and when required.. This approach is effective, because trainers are selected directly from a large pool of employees (based on the topic) which enables identification of appropriate individual (expert) who can effectively train on the relevant topic. Where as, training by few selected experts would be restrictive, because those selected trainers may not have sufficient knowledge on some of the topics/skills needed by employees. Training effects are continuously observed by individuals' supervisors. Finally, those who have achieved sufficient skills to operate as empowered employees are authorised by certification.

During the implementation phase, employee attitudes and their grievances should be perceived, analysed and remedial actions undertaken to solve them. This process is ongoing. Employee attitudes are periodically surveyed through questionnaires by senior staff. Employees are encouraged to report their grievances at work. They are first reported to immediate supervisors, who address minor grievances. The major ones are forwarded to the senior management. See Appendix (Figures 3 and 4) for the DFD model of implementation phase.

4.2.1 Evaluation of the implementation phase

Based on the above discussion (of the DFD model of the implementation phase), the following proposals of the implementation phase are presented below for your evaluation.

(Please tick appropriate and comment in the space provided)

Initial training and involvement

- **Senior management (including the Group Board) receives training on empowerment related issues.**

Importance:

Senior management training is:

Important	☐
Less important	☐
Not at all important	☐

Time:

Senior management:

Could find time to undergo training	☐
Hard to find time for this training	☐

- **Senior management conducts a series of workshops to train employees (including middle management) on empowerment, problem solving tools and techniques, and teamwork principles.**

Time

	Yes	Not certain	No
This may adversely affect the involvement of senior management in day-to-day job	☐	☐	☐

Locations

	Yes	Not certain	No
Scattered locations of regional offices will be a problem in conducting workshops.	☐	☐	☐
The problem of different locations can be overcome by some means	☐	☐	☐

- **Departments/sections and employees are encouraged to adopt empowerment voluntarily.**

Benefits

	Yes	Not certain	No
Voluntary participation encourages employees to adopt empowerment.	☐	☐	☐

Time

	Yes	Not certain	No
Takes long time for involvement of all employees (because employees are empowered to take decision to adopt empowerment).	☐	☐	☐
Commitment of senior management and continuous encouragement would enable quick involvement of employee.	☐	☐	☐

- **Supervisors of individuals establish Personnel Development Folders to follow up both their performance and skill improvements.**

Change of jobs

	Yes	Not certain	No
This exercise would radically change the current role of supervisors, so impractical	☐	☐	☐
This exercise would radically change the current role of supervisors, but still possible	☐	☐	☐
Would make some minor changes, so feasible	☐	☐	☐
Would not make any difference from current practice	☐	☐	☐

Paperwork

	Yes	Not certain	No
Involves too much paperwork, so impractical	☐	☐	☐
Too much paperwork but important to track skills & developments of employees	☐	☐	☐
Does not involve much paper work compared to current practice	☐	☐	☐

Cost

	Yes	Not certain	No
Is a costly exercise (e.g. cost of resources and time)	☐	☐	☐
Not costly compared to current practice	☐	☐	☐
Costly, but important	☐	☐	☐

Training

- **Training needs of individuals are identified by both the supervisor and the individual.**
- **The personnel department prepares schedules and topics (from the training needs reported to it) for training, and identifies suitable trainers (amongst employees) for the training topics.**
- **Supervisors continuously track performance and skill improvements of individuals, and recommends for skill certification for having obtained sufficient ability to act as empowered individuals. Information regarding these follow up measures are documented in the Personnel Development Folders.**

Change of jobs

	Yes	Not certain	No
This above training system would radically change the current role of both supervisors and personnel department, so impractical	☐	☐	☐
The above training system would radically change the current role of both supervisors and personnel department, but still possible	☐	☐	☐
Would make only minor changes in the current role of both supervisors and personnel department	☐	☐	☐
Would not make any difference from current practice	☐	☐	☐

Time and cost

The above training system is:

	Yes	Not certain	No
costly and time consuming, so impractical	☐	☐	☐
costly and time consuming, but still necessary for empowerment	☐	☐	☐
not much costly and time consuming compared to the current system	☐	☐	☐

Benefits

	Yes	Not certain	No
This training system would improve activity based training and offer efficient multidisciplinary skills to individuals, because suitable trainers are selected from a large pool of employees.	☐	☐	☐

This training system would achieve:

radical improvement in employee training ☐

moderate improvement in employee training ☐

no significant improvement ☐

Attitudes and grievances

- **The senior management continuously observes employees' attitudes (on involvement, satisfaction, and problems) towards jobs and takes remedial actions.**
- **The senior management, middle management, and supervisors at their respective levels observe any grievances from employees and solve them promptly.**

Time

	Yes	Not certain	No
Time consuming for management, so impractical	☐	☐	☐
Time consuming for management, but important in an empowered environment	☐	☐	☐
Can be efficiently managed without investment of much time	☐	☐	☐

Benefits

The grievances system:

	Yes	Not certain	No
Enhances employee satisfaction	☐	☐	☐
Stimulates continuous improvement	☐	☐	☐
Improves partnership between management and employees	☐	☐	☐

Comments on the implementation phase:

(Please continue on a separate sheet if required)

4.3 Sustaining phase

The DFD model of the sustaining phase can be seen in Figures 5 to 8. The key processes involved during the sustaining phase are: periodic survey/meetings with external customers and suppliers to assess company's performance; process improvements by senior management and departments; process improvements by employees or teams; company level performance measurements; and recognition of employees' achievements. Feedback from external customers and suppliers on companies' performance are used to identify problem areas for company level process improvements. In addition to internal problems, problems identified from feedback are continuously used by both departments/sections and employees at various levels of the organisation for process improvements. Improvement solutions are implemented and performance, both individual and at company level, is measured and benchmarked with competitors. Highest performers are recognised by supervisors and senior management.

External feedback on company performance is obtained by several means including, questionnaire survey, meetings, conferences, and seminars. These are mainly conducted by both the company's Main Board (senior management) and regional level management. Involvement of senior management and regional management in identifying problems would help employees of all regions to address both company level and regional level problems.

Having identified company level problems, the next step is to produce improvement plans for solving those problems. Task Teams at company level and/or regional level can be established, to analyse those problems and produce improvement solutions. These solutions are then passed on to respective individuals and/or departments for actual implementation. By this process, every individual in the organisation is well informed of company level problems (from the views of external participants) and improvement plans. This enables everyone to improve their processes towards achieving customer satisfaction.

In addition to company level improvements, employees identify dissatisfactions or discomforts related to their current state, and diagnose themselves why they are currently dissatisfied and how to move forward from that state. This includes the adoption of company level improvement plans within their processes. This exercise would result in the development of self-vision for future improvements. In this process, everyone needs to have a partner (can be either a manager, supervisor, colleagues, or friends) to listen and

assist in discovering right solutions. Continuous development of self-vision enables individuals to identify problems and consequent solutions within their processes and subsequently identify training needs to improve their skills. The Training Department (personnel department) can be contacted to continuously assist in acquiring sufficient skills. Problems identified from self-visions are assessed and solutions (developed along with their cost benefit analysis) are implemented with the assistance of partners. The finance department can be consulted to assist in analysing cost benefits of the solutions. Finally, a 360 degree appraisal survey is conducted to assess both self-improvements and identify further problems for improvements. This survey can be conducted with relevant participants (colleagues, external customers and suppliers). Results of this survey are reported to the Regional Management Team. This approach gives freedom to individuals to approach anybody in the organisation and seek assistance or advice in their development process. This allows a flexible team approach with identified experts, and enhances sharing of knowledge and expertise amongst individuals and teams.

Company level performance is measured by senior management, and benchmarked against results with identified competitors. To measure company level performance, data are collected from several sources including performance assessments of individuals, employee attitude surveys, and financial statements from finance departments. Finally, results should be published to employees.

Recognition of achievements is one of the important motivational factors for encouraging employees to be involved in business improvements. Both senior and middle management recognise highest accomplishments with awards, gifts, personal thanks and so on. It should be noted that the recognition system should be unbiased, otherwise, it would be counter-productive in motivating employees.

4.3.1 Evaluation of the sustaining phase

Based on the above discussion (of the DFD model of the sustaining phase), the following proposals for the sustaining phase are presented below for your evaluation.

(Please tick as appropriate and comment in the space provided)

Process improvements by senior management/department

- **Both the senior management and middle management periodically assess expectation and problems posed by external customers and suppliers (by conducting surveys and meetings with them), and observe company level problem areas.**
- **Establish company level or middle level task teams or identify individuals at respective levels to analyse company level problems and consequently, produce improvement plans.**
- **Distribute both company level and middle level improvement plans to all relevant employees to enable them to incorporate those plans in their day-to-day business.**

Job changes

Would require radical changes in the role of senior management ☐
Would require moderate changes in the role of the senior management ☐
Would require no significant changes from current practice ☐

Communication

Distant location of operating units would not affect communication amongst management and employees. ☐
Would affect communication, but can be overcome by computerised network or some other means. ☐

Cost

	Yes	Not certain	No
Is a costly exercise (e.g. cost of resources and time)	☐	☐	☐
Not costly compared to current practice	☐	☐	☐

Costly, but important ☐ ☐ ☐

Manpower requirement

The above tasks of senior management:

Would require additional staff, so impractical ☐

Would require additional staff, but essential to achieve customer satisfaction and customer satisfaction ☐

Does not require additional staff, current staff can be efficiently utilised ☐

Self-management system

- **Individuals identify appropriate partners to co-operate, advise, and assist them in their self development process.**
- **The partners can be either supervisors or anyone within the organisation who is able to cooperate in their improvement processes.**
- **Based on both company level/regional level problems and problems emerged from their own business, individuals continuously identify opportunities for improvements in their process and identify any deficiencies in their skills.**
- **Any problems or ill structured processes identified are analysed and improvement plans are proposed.**
- **Improvement plans or proposals are evaluated for their cost-benefits with the assistance of the finance department.**
- **Any deficiencies in skills identified are solved by further training with the assistance of the personnel department.**
- **Individuals continuously conduct an appraisal survey on their performance with everyone (including senior management, supervisors, partners, colleagues, and both internal and external customers and suppliers) related to their processes.**
- **Any problems or deficiencies observed from self-performance measurements (appraisal survey) are continuously analysed for further improvements.**
- **Partners assist individuals and offer suggestions in all of the above self-development processes.**

Change on jobs

The self management system would require:

A radical change in current practice, so impractical ☐

A radical change, but feasible ☐

Moderate change in current practice, so impractical ☐

Moderate change, but feasible ☐

No change in current practice ☐

Superior/subordinate relationship

The partnership arrangement in the self-management system would:

Be difficult to implement, so impractical ☐

Be difficult to implement, but important in the implementation of empowerment ☐

Be implemented without much difficulty ☐

Improve individual-supervisor relationship (if the partner is the supervisor) ☐

Not improve individual-supervisor relationship (if the partner is the supervisor) ☐

Skills

The self management system requires various skills including problem solving, self-performance assessment, inter personal, and teamwork and so on.

These skills can:

Be developed within individuals to efficiently perform the self-management system ☐

Not be developed within individuals ☐

Current skills of individuals are sufficient to perform the self-management system ☐

Cost

The cost of involvement time for partners and other participants (including cost of other resources such as communication paperwork and so on) in the self-management system:

Would be high ☐

Would be moderate ☐

Would not be significant ☐

Attitude

Changing staff attitude to adopt the self-management system will be:

Impractical ☐

Possible ☐

Currently in existence ☐

Group level performance assessment

- **Based on performance data obtained from all sources including, self or team/department performance improvements, financial performance, and employee surveys, senior management analyse company level performance.**
- **Senior management benchmarks company level performance with identified business competitors.**
- **Senior management publishes both successes and failures to employees and external customers and suppliers.**

Data collection and analysis

Company level data collection would require additional facilities (including communication facilities) to handle a large number of documents and data. This is:

Impractical ☐

Possible ☐

Currently in practice ☐

Cost

Cost of involvement time by senior management would be:

High ☐

Moderate ☐

Not different from the current practice ☐

Paperwork cost would be:

High ☐

Moderate ☐

Not different from current practice ☐

Recognition

- **Successful performers including teams or departments are continuously recognised by awards and gifts.**

Award system

Impractical to maintain an unbiased regular award system ☐

Possible to maintain an unbiased regular award system ☐

Cost

The award system would incur high investment ☐

Would require only a meagre amount ☐

Would not require significant investment ☐

Comments on the sustaining phase:

(Please continue on a separate sheet if necessary)

APPENDIX

A GENERIC MODEL OF IMPLEMENTATION OF EMPOWERMENT

Section A: Generic model of the preparation phase

The generic model of the preparation phase is illustrated in Figures 1 and 2. The data description of the generic model of the preparation phase is described below.

DEVELOP VISION (*Entry type*: Process)

Specification: This process deals with the following data: new strategic directions and ideas; middle level vision/suggestions; suggestions/comments; and vision. The Company Board (senior management) is responsible for developing vision. The Middle Management become involved in developing company level vision and also produces middle level (regional level) vision in line with the company level vision. Employees' input, in the form of suggestions and comments are sought to both improve and assess the feasibility of the vision.

NEW STRATEGIC DIRECTIONS & IDEAS (*Entry type*: Data element)

MIDDLE LEVEL VISION/SUGGESTIONS (*Entry type*: Data/Resource element)

SUGGESTIONS/COMMENTS (*Entry type*: Data element)

VISION (*Entry type*: Data element)

DEVELOP POLICY (QUALITY POLICY, EMPLOYEE POLICY) (*Entry type*: Process)

Specification: This process deals with the following data: company level policies; middle level problems and policies; vision; suggestions/comments; and policy. The Company Board develops the company level policy for achieving the vision. The policy included both the quality and employee related issues. The middle level problems and associated policies are shared between the Company Board and the Middle Management to produce a common policy that is applicable to all levels of the company. External consultants may be appointed for advice in producing a suitable policy for the company.

COMPANY LEVEL POLICIES (*Entry type*: Data element)

MIDDLE LEVEL PROBLEMS & POLICIES (*Entry type*: Data element)

POLICY (*Entry type*: Data element)

DIAGNOSE ORGANISATIONAL CAPABILITIES (*Entry type*: Process)

Specification: This process deals with the following data: policy; questionnaire/data; preparedness, attitudes and satisfaction; data/personnel for assistance; and results. The Company Board (senior management) conducts questionnaire survey amongst employees regarding company's policies and commitment to empowerment. Employees' attitudes and preparedness for the implementation of empowerment are assessed. The Middle Management provides necessary data and offers assistance to the Company Board in evaluating various aspects of the organisation including the organisational structure and funds for implementing empowerment.

QUESTIONNAIRE/DATA (*Entry type*: Data element)

PREPAREDNESS, ATTITUDES & SATISFACTION (*Entry type*: Data element)

DATA/PERSONNEL FOR ASSISTANCE (*Entry type*: Data/Resource element)

DEVELOP IMPLEMENTATION PLAN (*Entry type*: Process)

Specification: This process deals with the following data: implementation strategies and plans; results; data/personnel for assistance; and required resources. The Company Board identified appropriate strategies and produced plans for the implementation process. Results of the organisational diagnosis and data from Middle Management are used to produce an effective plan. This includes physical involvement of the middle level managers in producing the implementation plan. The implementation plan also identifies the necessary resources required for implementation.

IMPLEMENTATION STRATEGIES & PLANS (*Entry type*: Data element)

DATA/PERSONNEL FOR ASSISTANCE (*Entry type*: Data/Resource element)

RESULTS (*Entry type*: Data element)

REQUIRED RESOURCES (*Entry type*: Data element)

DEVELOP RESOURCES (*Entry type*: Process)

Specification: This process deals with the following data: required resources; required major resources; resources; data and estimate of resources; cost benefit report/feedback (see Figure 2). Resources required for the implementation process are identified at all levels of the organisation.. The minor resources are assessed and solved at the middle level, and the major resources are assessed and solved by the Company Board. The Finance Department assist both the Senior Management and Middle Management to assess the resources for cost benefit.

REQUIRED MAJOR RESOURCES (*Entry type*: Data element)

RESOURCES (*Entry type*: Data/Resource element)

DATA & ESTIMATE OF RESOURCES (*Entry type*: Data element)

COST BENEFIT REPORT/FEEDBACK (*Entry type*: Data element)

Figure 8.35. Generic model - Level 1 DFD - Preparation phase

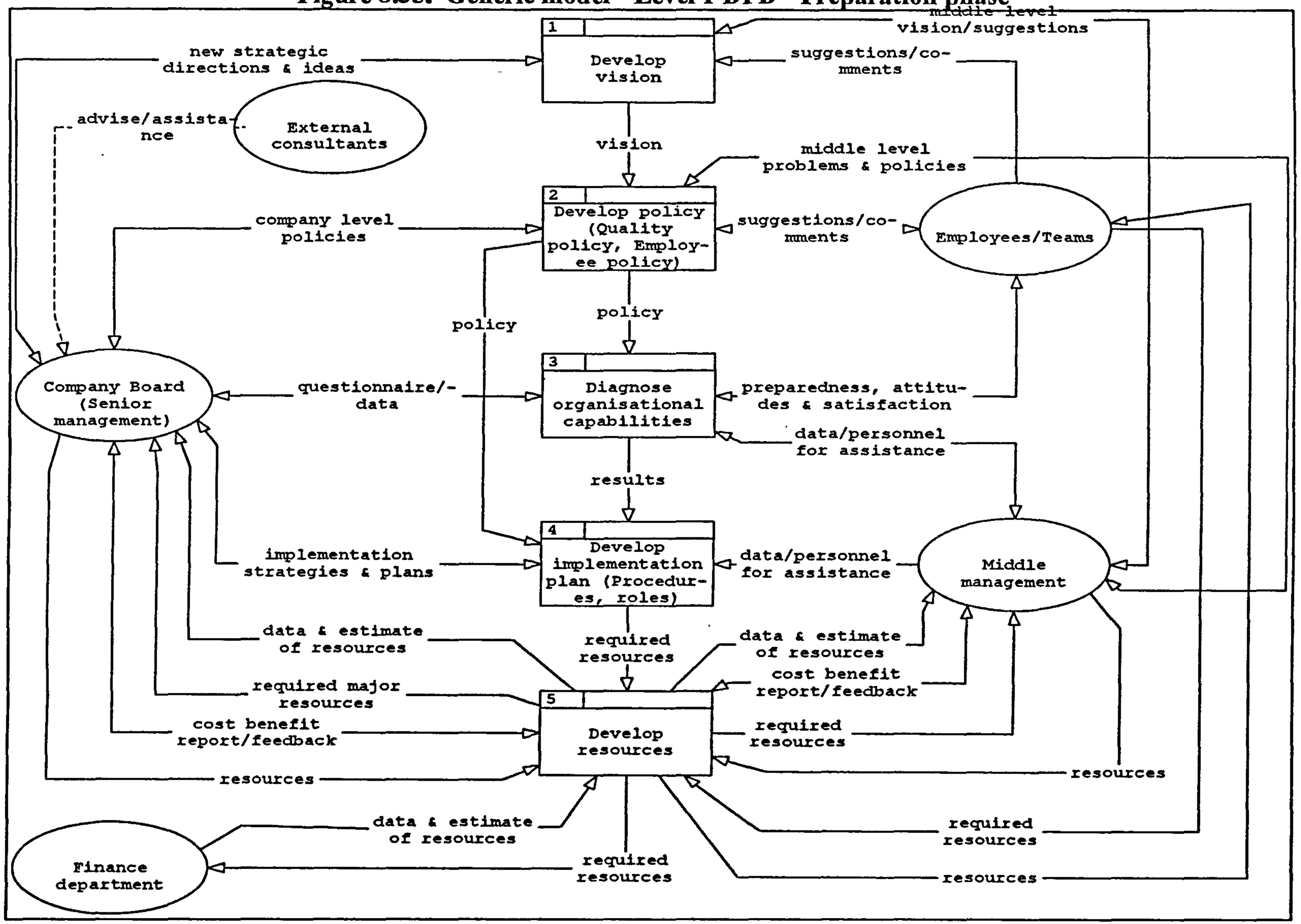
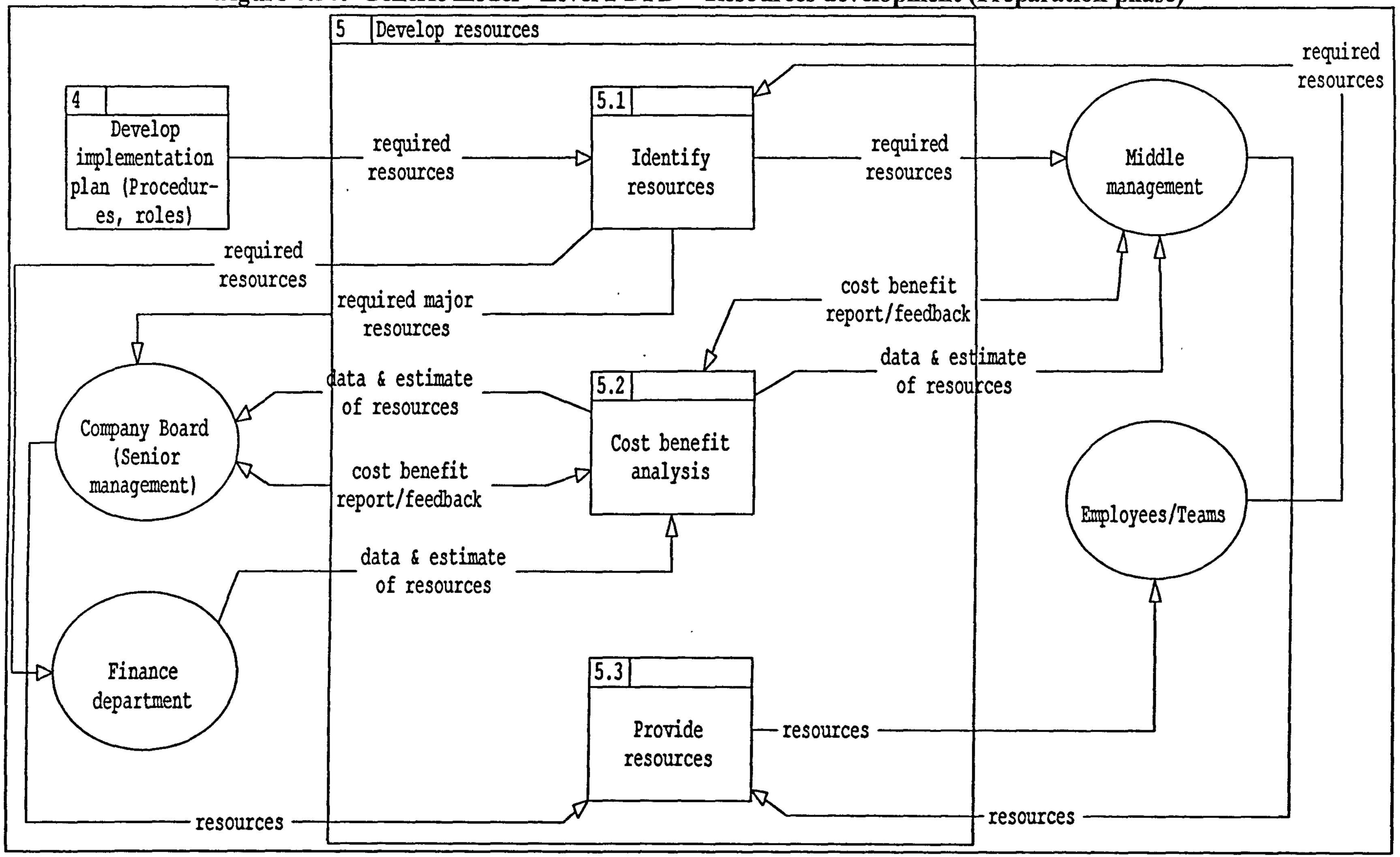


Figure 8.36. Generic model - Level 2 DFD - Resources development (Preparation phase)



Section B: Generic model of the implementation phase

The generic model of the implementation phase is illustrated in Figures 3 and 4. The data description of the DFD model of the implementation phase is described below.

INDUCTION WORKSHOPS (*Entry type*: Process)

Specification: This process deals with the following data: awareness, problem solving and teamwork principles; and initial training and training strategy. Initially, the Company Board (senior management) receives training from external consultants. These consultants also assist senior management in producing an appropriate strategy for training employees. Then, a series of workshops are conducted by senior management to train both the middle management and employees on these issues.

INITIAL TRAINING & TRAINING STRATEGY (*Entry type*: Data element)

AWARENESS, PROBLEM SOLVING & TEAMWORK PRINCIPLES (*Entry type*: Data element)

ESTABLISH PERSONNEL DEVELOPMENT FOLDER (*Entry type*: Process)

Specification: This process deals with the following data: details; personal details and performance; established folder; personal development folder; and observed performance. Personnel Development Folders are established for every individual by their immediate supervisors. Individuals' performance and other details including skill, training and so on are observed both by supervisors and individuals. The details are recorded in the folder by the supervisor for future reference.

DETAILS (*Entry type*:'Data element)

PERSONAL DETAILS AND PERFORMANCE (*Entry type*: Data element)

ESTABLISHED FOLDER (*Entry type*: Data element)

OBSERVED PERFORMANCE (*Entry type*: Data element)

PERSONAL DEVELOPMENT FOLDER (*Entry type*: Data store)

CONTINUOUS TRAINING (*Entry type*: Process)

Specification: This process deals with the following data: training needs; trainers; request for trainers/feedback; training schedule/topics; learned skills; education and skills; training effects; sufficiently skilled employees; training certificate; and certification details (see Figure 4). Both employees and supervisors jointly identify skill deficiencies and needs for training, and report to the personnel department, who prepares schedules and topics and selects suitable trainers specific to subject modules, and arranges training. Effects of training are observed and documented by supervisors. Successful performers who are

perceived as acquired sufficient skills to act as empowered individuals are recommended to the personnel department for certification.

TRAINING NEEDS (*Entry type*: Data element)

REQUEST FOR TRAINERS/FEEDBACK (*Entry type*: Data element)

TRAINERS (*Entry type*: Data/Resource element)

REQUEST FOR TRAINERS (*Entry type*: Data element)

TRAINING SCHEDULE/TOPICS (*Entry type*: Data element)

LEARNED SKILLS (*Entry type*: Data element)

EDUCATION & SKILLS (*Entry type*: Data element)

TRAINING EFFECTS (*Entry type*: Data element)

SUFFICIENTLY SKILLED EMPLOYEES (*Entry type*: Data element)

TRAINING CERTIFICATE (*Entry type*: Data element)

CERTIFICATION DETAILS (*Entry type*: Data element)

EMPLOYEE ATTITUDE SURVEY (*Entry type*: Process)

Specification: This process deals with the following data: questionnaires/feedback; satisfaction, problems, grievances; training and awareness needs; results; and grievances. The senior management (company board) continuously observes employees attitudes including satisfaction levels and problems with their jobs through periodic questionnaire surveys. Results are published and disseminated back to employees. Based on the results, further actions are taken for improvement. Any training or awareness needed by employees, as perceived from the survey analysis, are reported to the personnel department.

QUESTIONNAIRES/FEEDBACK (*Entry type*: Data element)

SATISFACTION, PROBLEMS, GRIEVANCES (*Entry type*: Data element)

RESULTS (*Entry type*: Data element)

GRIEVANCES (*Entry type*: Data element)

TRAINING & AWARENESS NEEDS (*Entry type*: Data element)

GRIEVANCES SOLVING (*Entry type*: Process)

Specification: This process deals with the following data: grievances; solved minor grievances; grievances solved; major grievances; and solved major grievances. Grievances are identified by several means, including Employee Attitude Surveys and formal grievances reporting. Grievances perceived by employees are reported to supervisors, who solves minor problems, and forwards the major ones to either the senior management or middle management depending on the nature of the problem.

GRIEVANCES (*Entry type*: Data element)

SOLVED MINOR GRIEVANCES (*Entry type*: Data/resource element)

MAJOR GRIEVANCES (*Entry type*: Data element)

SOLVED MAJOR GRIEVANCES (*Entry type*: Data/resource element)

GRIEVANCES SOLVED (*Entry type*: Data/resource element)

Figure 8.38. Generic model - Level 1 DFD - Implementation phase

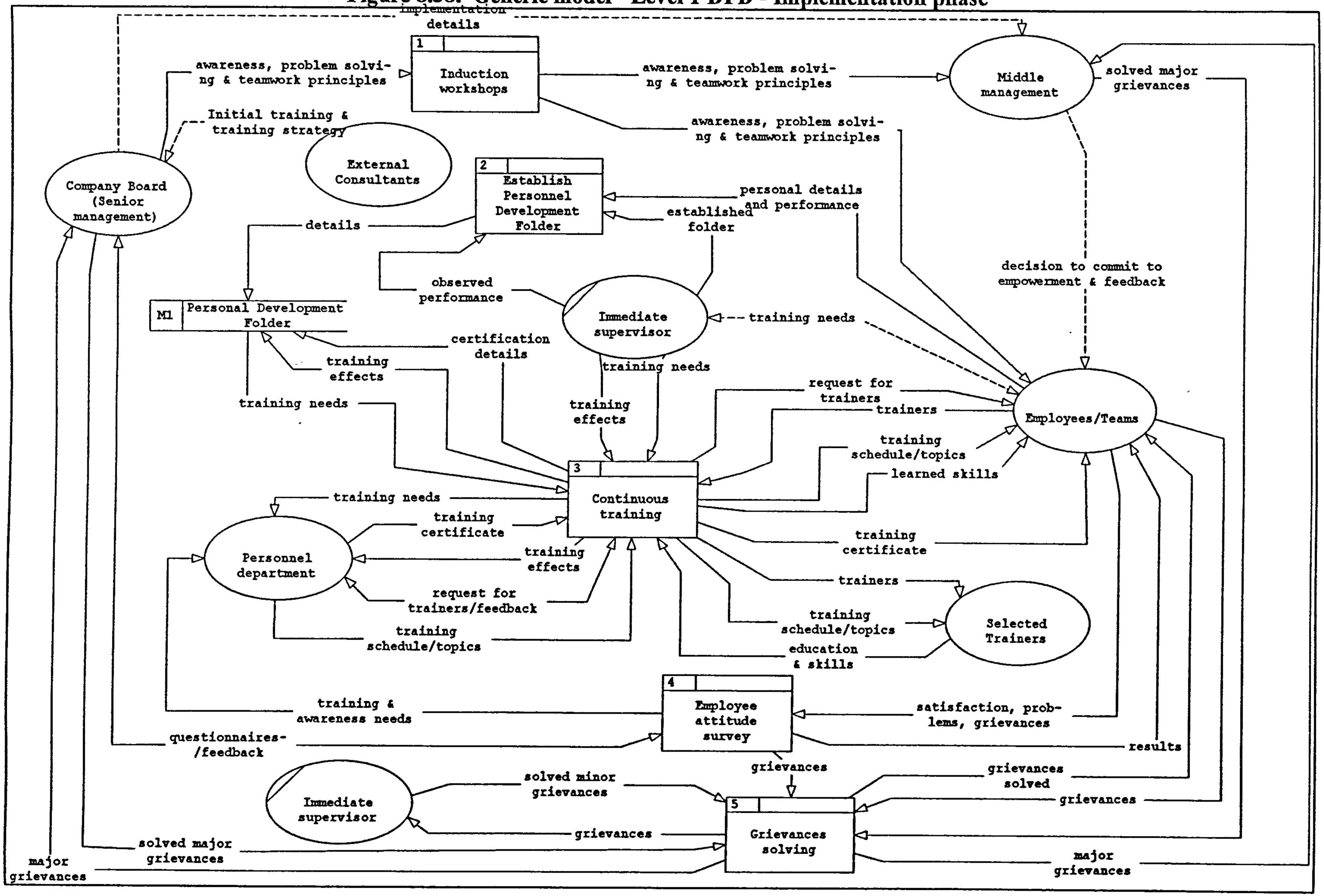
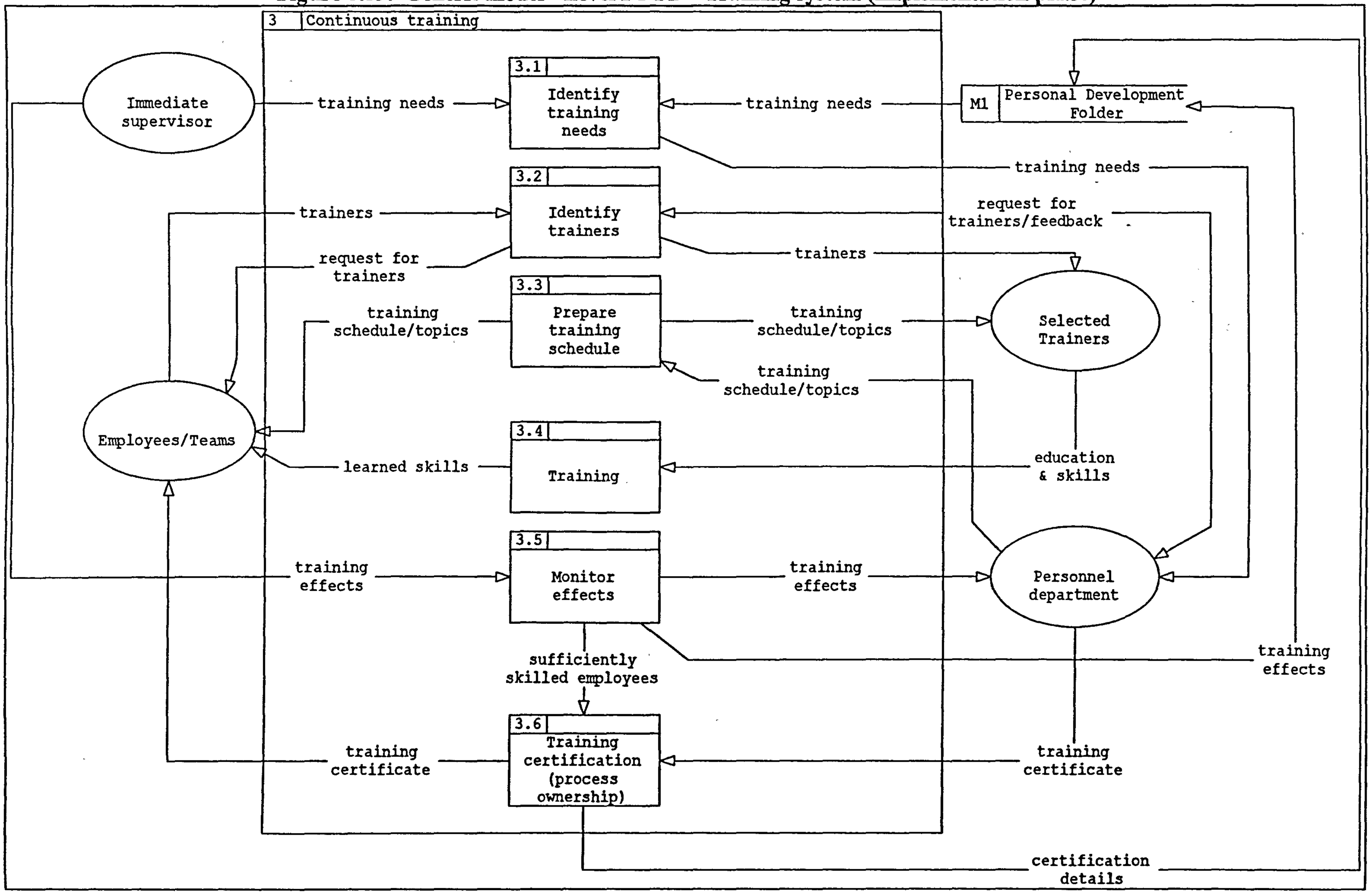


Figure 8.39. Generic model - Level 2 DFD - Training system (Implementation phase)



Section C: Generic model of the sustaining phase

The generic model of the sustaining phase is illustrated in Figures from 5 to 8. The data description of the DFD model of the sustaining phase is described below.

PERIODIC SURVEY (*Entry type*: Process)

Specification: This process deals with the following data: list of customers/suppliers; and expectations/problems. Both customers and suppliers are involved through periodic surveys or meetings, where, their requirements and perceptions on the service provided by the company are shared. Both Company Board (senior management) and the Middle Management are involved in these activities and identify problems for improvements.

LIST OF CUSTOMERS/SUPPLIERS (*Entry type*: Data element)

EXPECTATIONS/PROBLEMS (*Entry type*: Data element)

PROCESS IMPROVEMENTS BY SENIOR MANAGEMENT/DEPARTMENT (*Entry type*: Process)

Specification: This process deals with the following data: expectations/problems; middle level improvement plans; company level task teams; middle level task teams; company level problems; company level improvement plan for approval; middle level improvement plan for approval; company level improvement plan; improvement plans/feedback; and established team/identified individual (see Figure 6). One of the main sources for identification of company level problems is contacts with external customers and suppliers. Once a major problem is identified the Company Board establishes Task Teams to explore the problem. The company level Task Team studies the problem, produces company level improvement plan, and submits this to the Company Board for approval. The approved plans are distributed to middle level management including all departments, which, in turn establish middle level Task Teams (depending upon the need) or identify appropriate individuals to produce middle level improvement plans. Both company level and middle level improvement plans are distributed to all employees for adoption in their business.

EXPECTATIONS/PROBLEMS (*Entry type*: Data element)

COMPANY LEVEL PROBLEMS (*Entry type*: Data element)

COMPANY LEVEL TASK TEAMS (*Entry type*: Data element)

MIDDLE LEVEL TASK TEAMS (*Entry type*: Data element)

ESTABLISHED TEAM/IDENTIFIED INDIVIDUAL (*Entry type*: Data element)

IMPROVEMENT PLANS/FEEDBACK (*Entry type*: Data element)

COMPANY LEVEL IMPROVEMENT PLAN FOR APPROVAL (*Entry type*: Data element)

MIDDLE LEVEL IMPROVEMENT PLANS (*Entry type*: Data element)
MIDDLE LEVEL IMPROVEMENT PLAN FOR APPROVAL (*Entry type*: Data element)
COMPANY LEVEL IMPROVEMENT PLAN (*Entry type*: Data element)
SELF MANAGEMENT SYSTEM (*Entry type*: Process)
Specification: This process deals with the following data: invitation to partners; agreement to partnership; signed agreement; vision; assistance/comments/suggestions; self-vision/feedback; improvement areas/problems; training needs if any; proposals; plans for improvement/feedback; training/assistance; learned skills; assistance/estimate; analysis report; analysis report/feedback; performance; results; and questionnaires/feedback (see Figure 7). Empowered employees identify and invite partners to cooperate, listen and assist in discovering right solutions for problems. In this process, employees identify dissatisfaction or discomfort related to their current state, and diagnose themselves in terms of why they are currently dissatisfied and how to move forward from that state. This includes the adoption of departmental improvement plans within their processes. This exercise results in the development of self-vision. The self-vision continuously enables individuals to identify problems within their processes and simultaneously identify training needs to improve their skills. The Personnel Department continuously assists them to acquire sufficient skills to effectively perform their duties. Any problems identified from their self-visions are assessed and solutions (proposals) are developed (along with their cost benefit analysis), and implemented with the assistance of partners. The Finance Department assists them in analysing the cost benefits of their proposals. The proposals are submitted to the respective middle level management for comments. Finally, a 360 degree appraisal survey is conducted to both assess self-improvements and identify further problems for improvements. This survey is conducted with relevant participants (colleagues, external customers and suppliers). Results of this survey are reported to the middle management.
INVITATION TO PARTNERS (*Entry type*: Data element)
AGREEMENT TO PARTNERSHIP (*Entry type*: Data element)
SIGNED AGREEMENT (*Entry type*: Data element)
VISION (*Entry type*: Data element)
SELF-DEVELOPMENT VISION FOLDER (*Entry type*: Data store)
ASSISTANCE/COMMENTS/SUGGESTIONS (*Entry type*: Data/Resource element)
SELF-VISION/FEEDBACK (*Entry type*: Data element)
IMPROVEMENT AREAS/PROBLEMS (*Entry type*: Data element)
TRAINING NEEDS IF ANY (*Entry type*: Data element)

PROPOSALS (*Entry type*: Data element)
TRAINING/ASSISTANCE (*Entry type*: Data/Resource element)
LEARNED SKILLS (*Entry type*: Data element)
PLANS FOR IMPROVEMENT/FEEDBACK (*Entry type*: Data element)
ASSISTANCE/ESTIMATE (*Entry type*: Data/resource element)
ANALYSIS REPORT (*Entry type*: Data element)
ANALYSIS REPORT/FEEDBACK (*Entry type*: Data element)
FEASIBLE PROPOSALS (*Entry type*: Data element)
RESULTS (*Entry type*: Data element/results of implementation)
PERFORMANCE (*Entry type*: Data element)
QUESTIONNAIRES/FEEDBACK (*Entry type*: Data element)
COMPANY LEVEL PERFORMANCE MEASUREMENTS (*Entry type*: Process)
Specification: This process deals with the following data: data required/received; performance; financial data/assistance; analysis details/feedback; data; results; survey/feedback; feedback; and publications (see Figure 8). The Company Board (senior management) is responsible for this process. Company level measures include: performance of individuals observed from the self management system; financial data obtained from finance departments, and other surveys. All of these measures are periodically collected and assessed by the senior management. The finance department assists the senior management in financial calculations. Results of these measures are benchmarked against identified business competitors through surveys. Finally the results are published.
DATA REQUIRED/RECEIVED (*Entry type*: Data element)
PERFORMANCE (*Entry type*: Data element)
FINANCIAL DATA/ASSISTANCE (*Entry type*: Data/Resource element)
ANALYSIS DETAILS/FEEDBACK (*Entry type*: Data element)
DATA (*Entry type*: Data element)
RESULTS (*Entry type*: Data element)
SURVEY/FEEDBACK (*Entry type*: Data element)
FEEDBACK (*Entry type*: Data element)
PUBLICATIONS (*Entry type*: Data element)
RECOGNISE ACHIEVEMENTS (*Entry type*: Process)
Specification: This process deals with the following data: recommendation for award/presentations; selected accomplishers; and awards/thanks. Partners or supervisors recognise achievements and recommend to the middle management for an award or

presentations by the accomplishments. The middle management select the highest achievements and awards them.

RECOMMENDATION FOR AWARD/PRESENTATIONS (*Entry type*: Data element)

SELECTED ACCOMPLISHERS (*Entry type*: Data element)

AWARDS/THANKS (*Entry type*: Data/Resource element)

Figure 8.41. Generic model - Level 1 DFD - Sustaining phase

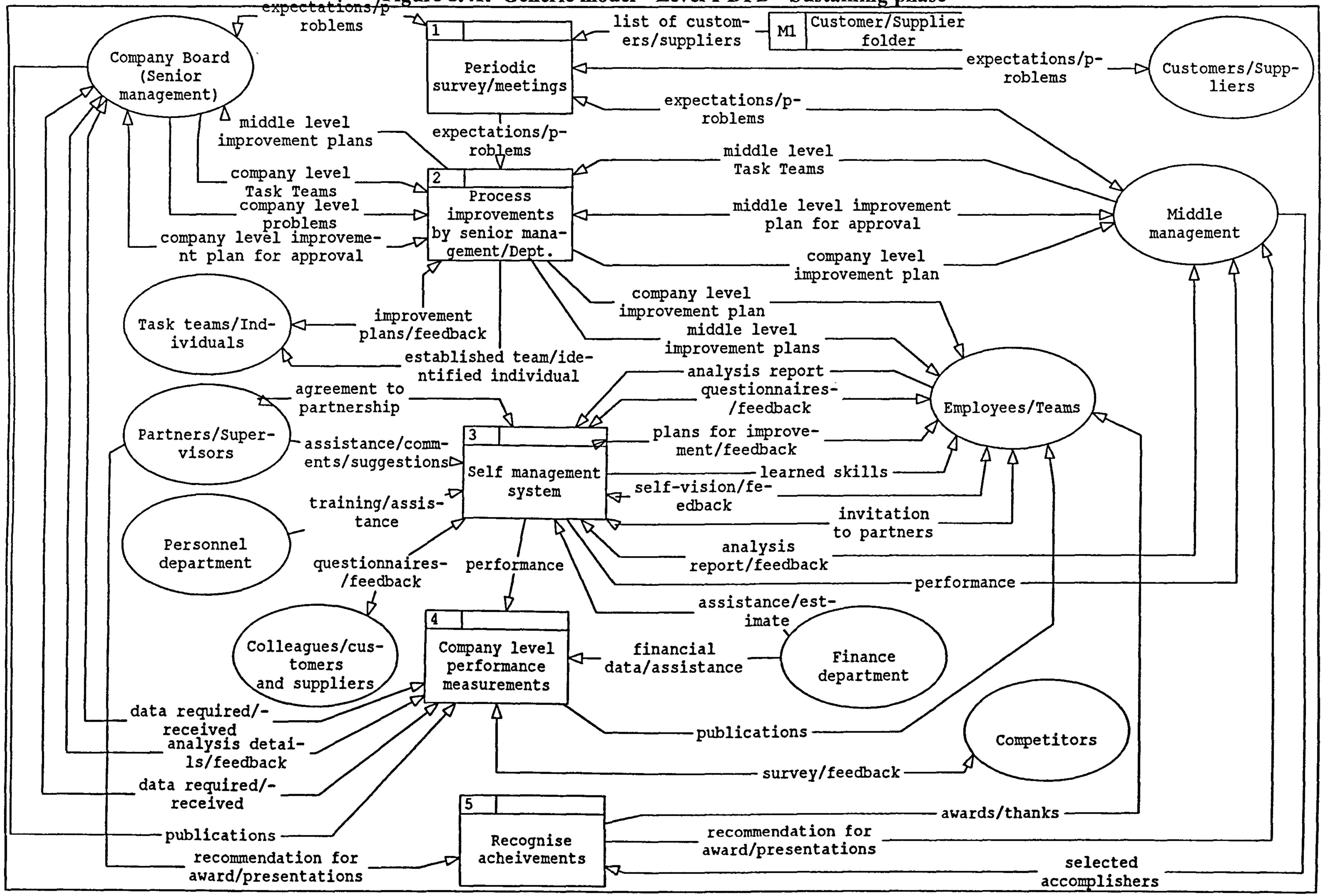


Figure 8.42. Generic model - Level 2 DFD - Process improvement by senior management/Department (sustaining phase)

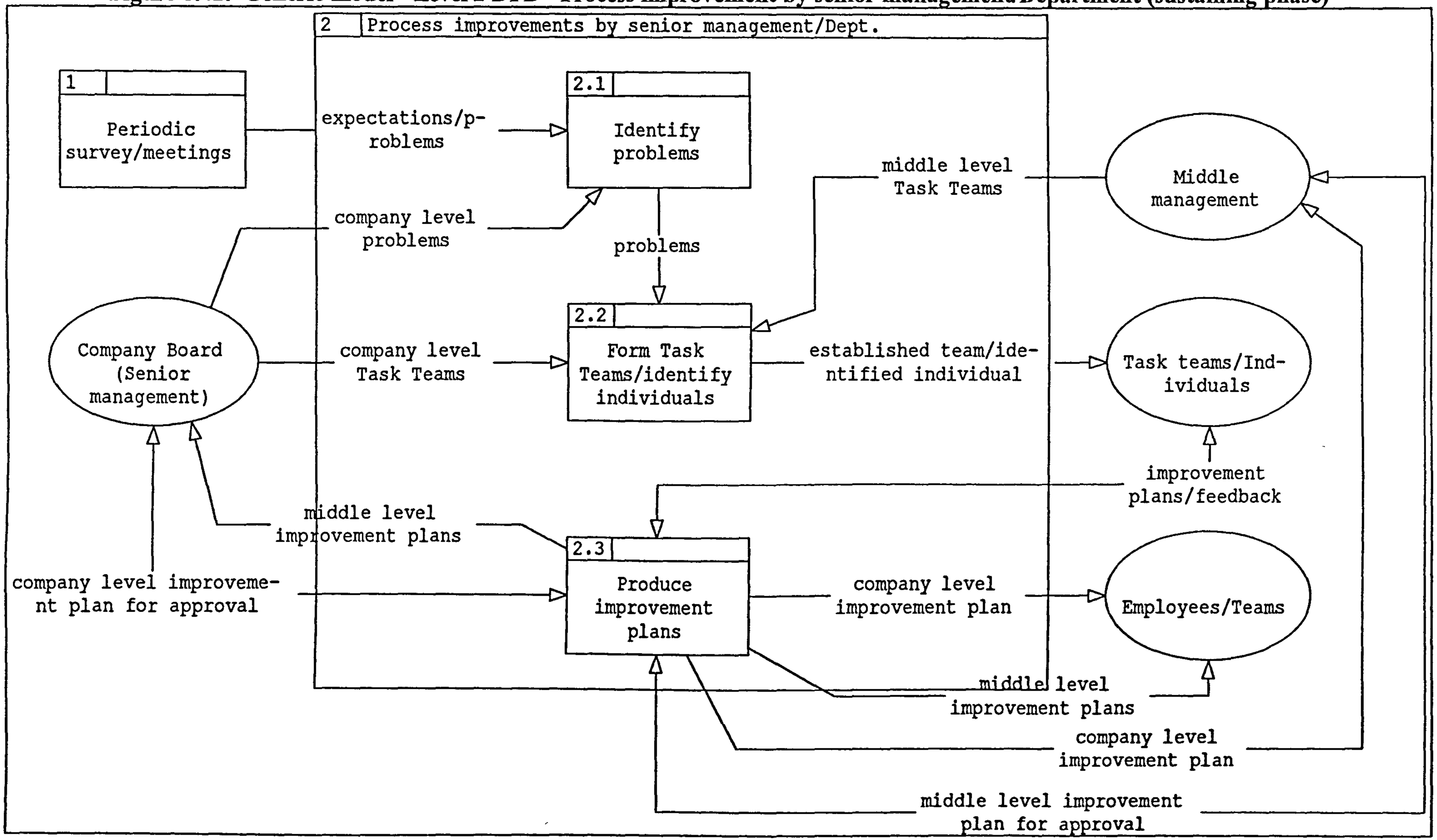


Figure 8.43. Generic model - Level 2 DFD - Self management system (Sustaining phase)

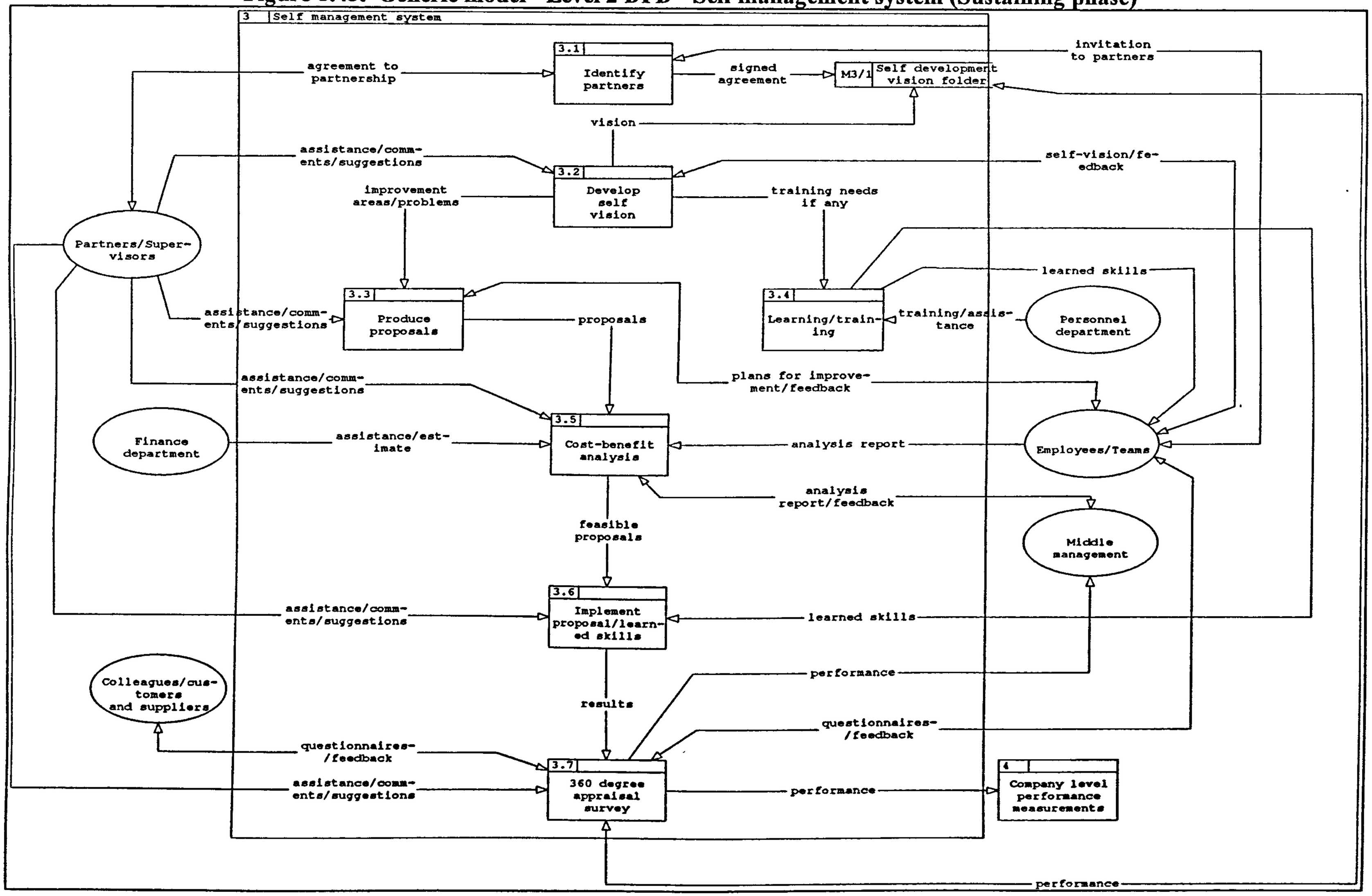


Figure 8.44. Generic model - Level 2 DFD - Company level performance measurements (sustaining phase)